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From generators to mirrors – a comparison of phonological theories

Generatory i zwierciadła – porównanie teorii fonologicznych

Streszczenie:

W niniejszym artykule porównane są dwa główne podejścia teorii fonologicznych dwudziestego wieku do zagadnienia, czym powinna zajmować się fonologia i jakie w tym celu wykorzystać mechanizmy. Te podejścia formalne dzielą się na teorie zasad (np. Fonologia Generatywna) i teorie reprezentacji (np. Fonologia Rządu). Ukazane są tu główne założenia i cele obu teorii, jak i mechanizmy formalne służące do osiągnięcia tych celów. Autor przedstawia przykłady konkretnych struktur sylabicznych i analiz dotyczących zjawisk fonologicznych w językach polskim i angielskim.

Słowa kluczowe: fonologia, zasada, reprezentacja, nagłos, ośrodek sylaby, wygłos (koda) pusta kategoria.

Summary:

This article offers a comparison of the main twentieth century phonological approaches to the idea of phonological goals and analytic methods. These formal approaches can be divided into the theories of rules (e.g. Generative Phonology) and the theories of representations (e.g. Government Phonology). What is shown below is the chief assumptions and goals of both theoretical frameworks as well as the formal mechanisms which help to achieve these goals. This is accompanied with examples of syllabic structures and analyses of phonological phenomena in both Polish and English.

Keywords: phonology, rule, representation, onset, nucleus, coda, empty category.

1. Introduction

The history of phonology shows that phonological science has always taken no fewer than two dissimilar ways: one was to concentrate on the representations of phonological utterances, while the other was to focus on how what is phonological (or abstract) should affect what is phonetic (or physical). From time immemorial phonologists have argued about the things which should be subject to phonological analysis. The first modern phonologist, Ferdinand de Saussure, adopted the view that there was a clear distinction between what is perceived by the speakers of a given language as a phonologically distinctive pattern of speech sounds (*langue*) and what is actually used in speech (*parole*). This division may be said to correspond to the commonly accepted standpoint that what we feel about our language (our linguistic competence) may differ slightly or more considerably from what we really employ while using the language (our performance). De Saussure's views found different types of feedback in subsequent phonological theories which were roughly dealing with the question of whether to concentrate on deriving the phonetic (real) things from the phonological (imaginary/abstract) material or to adopt the stance that the phonological representation is one, stable and not subject to derivation. In other words, the battle has been about the theories of rules and the theories of representations. Here we will concentrate on relatively recent models representing both types.

The most prominent theory of rules is apparently Generative Phonology[1]. In this approach and in its numerous variations and continuations, including even a recent development called Optimality Theory[2], it is assumed that there is an abstract level (phonological or underlying) of utterances, which, via rules (or constraints), is transformed into something more real(istic) – the phonetic level. As regards the other viewpoint – theories of representations, the framework of Government Phonology[3] appears to be the most reasonable model of phonology dealing with phonological representations which are non-linear, multi-layered and unchangeable from the viewpoint of derivation.

In this paper a brief account of Generative Phonology will be presented and followed by an introduction to the basic concepts of Government Phonology and its daughter frameworks.

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[1] N. Chomsky and M. Halle, *Sound pattern of English*, New York 1968; M. Kenstowicz and C. Kisseberth, *Generative phonology. Description and theory.* New York 1979.

[2] A. Prince and P. Smolensky, *Optimality theory: constraint interaction in generative grammar*. New Brunswick 1993.

[3] J. Harris, *English sound structure*, Oxford 1994; J. Kaye, J. Lowenstamm and J.-R. Vergnaud, *Constituent structure and government in phonology*, "Phonology" 1990 No. 7.

2. Generative Grammar and Phonology

As the name suggests, Generative Phonology is a theory which generates things. It does so via rules. In syntax, from a limited number of rules a vast and infinite number of sentences can be generated. In this field of grammar the theory works relatively well, especially given that many attempts have been made to reduce the number of rules and make the theory more restrictive.[4] In phonology the situation is much more complex.

2.1. Rules and levels of representation

Generative Phonology is famous and notorious for the employment of cosmic numbers of phonological rules. What they do is account for almost every process which takes place in a given language. Hence, it is always assumed that there is something basic (underlying) and something derived in every language. This basic thing is a string of abstract sounds (the phonological form of a word) which is related to the phonetic representation via rules. For example, the word-forms such as [los] *los* – 'fate' and [losu] *losu* – 'fate-gen.sg.' have one basic phonological representation, which is /los/. In the second case, this representation is suffixed with the genitive singular ending /u/ (by the suffixation rule), which yields the form [losu]. At times, when two or more rules have to apply to a given string of abstract sounds so as to explain the phonetic shape of a word, there must occur the so-called ordering of rules, i.e. they have to be applied in a particular order to become effective and faithful to the linguistic reality. Consider the following derivations of the Polish words [raci] *raki* –'crab-nom.pl' and [las i̇] *lasy* – 'forest-nom.pl':[5]

(1)	UNDERLYING	/rak+ ɨ/	/las+ ɨ/
fronting rule		i	
palatalization rule		c	
	PHONETIC	[raci]	[lasɨ]

What we see in (1) above is that, in abstract terms, the words *raki* and *lasy* consist of nominative singular stems such as /rak/ and /las/, which are followed by the nominative plural ending /ɨ̇/. Phonetically, the words are [raci] and [lasɨ̇], respec-

[4] A. Radford, *Transformational grammar*, Cambridge 1988.

[5] E. Gussmann, *Introduction to phonological analysis*, Warszawa 1980, p.90.

tively. In this derivation a few things have to be assumed. Above all, there is one phonological shape of the plural ending whose phonetic realizations (or allophones) are [i] and [ɨ̇]. This variant (or phoneme) is /ɨ̇/ because it surfaces in a larger number of contexts, while [i] appears only after palatalized consonants or velar stops. Thus, as regards the word *lasy*, the operation is simple: the suffix is added to the stem. In the other case, the situation is more complicated. What comes first is the so-called fronting rule, which fronts the underlying /ɨ̇/ into [i]. This fronting must occur because the phonetic [i] has to follow a velar stop. The sequences of velar stops followed by [ɨ̇] are not tolerated in Polish. The next step is the palatalization of the abstract sound /k/ to the palato-velar allophone [c] by the front vowel [i]. It should be noted that the reverse order of rules would not yield the correct result: if we tried to apply the palatalization rule first, it would fail to work because the sound [ɨ̇] does not palatalize the preceding consonants.

Unfortunately, in derivational analyses of this type the number of rules cannot possibly be diminished since every language requires many of these to account for various processes occurring in larger or smaller groups of sounds or even in single sounds in some languages.

It should also be noted that the targets chosen for phonological analysis are sometimes controversial. For example, the English pair such as [klɪə] *clear* vs. [klærɪtɪ] *clarity* apparently displays an alternation between a diphthong and a short vowel. In such a situation, a rule is necessary to transform either the diphthong into the short vowel or vice versa. Such a rule would practically explain an alternation in only one word. For there is nothing systematic in English telling us that all the diphthongs [ɪə] employed in adjectives should become [æ] in nouns. Quite conversely, if we take a pair such as [sɪn'sɪə] *sincere* vs. [sɪn'serɪtɪ] *sincerity*, the alternation is between [ɪə] and [e], which calls for another rule. Therefore, rules need to be postulated for very small chunks of a given language.

2.2. Distinctive Features

Finally, Generative Phonology makes use of distinctive features, which are the smallest properties out of which every speech sound is composed. They can be either positively (+) or negatively (–) valued. So, there are Major Class Features, e.g. consonant, syllabic, sonorant; Laryngeal Features, e.g. voice; Place Features, e.g. labial, coronal, velar, high, low; and Manner Features, e.g. continuant, nasal, etc. For example, the English labial stop [b] consists of the following features:

(2)
[+consonant, – syllabic, + obstruent, – nasal, – continuant, + labial, – velar, – coronal]

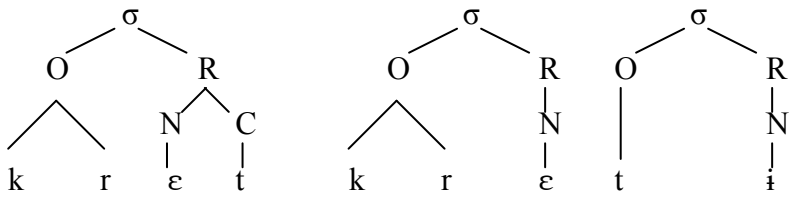
These features, whose number is uncertain, contribute to the theory in at least two ways. One is to provide the description of segments and to show how they differ from one another, e.g. the sound [p] differs from [b] presented in (2) by one feature, i.e. [p] is [– voice]. The other is to express generalization in rules: instead of separately writing several rules which refer to, say, all voiced stops in a given tongue, i.e. which describe the same process, we use features such as [+consonant, – syllabic, + obstruent, – continuant, +voice], and say that sounds possessing these features valued in this particular way are all subject to the process we deal with.

Regrettably, again, there are problems with distinctive features too. Above all, they are too numerous and no one actually knows how many of them should be used in what situations. If we look again at (2) above, we see that [b] is [+ labial, –velar, –coronal], etc. Is it not enough to say it is [+labial]? In some analyses we can see that it is, while in others we can find that every segment should be fully specified. Moreover, from the formal viewpoint, features describe two dissimilar bits of information: one is purely phonetic, e.g. [labial] or [high], while the other is relational or structural, e.g. [syllabic]. Phonetically, it is difficult to imagine or realize such a feature. Besides, two sets of facts about a segment seem formally unfortunate.

2.3. Syllable Structure

As regards the structure of syllables, Generative Phonology, as a theory of rules, not representations, is not particularly interested in it. Nonetheless, if need arises, every word can be graphically represented using the Greek character (σ) for the syllable as well as four other symbols for the syllabic constituents: (O) for onsets, (N) for nuclei, (R) for rhymes/rimes and (C/Co) for codas. Consider the following diagrams:

(3) a. b.



In (3a) we can see the syllabic structure of the Polish word [krɛt] *kret* – 'mole'. This word has one syllable, consisting of a branching onset [kr], a nucleus [ɛ] and a coda [t], which make a branching rhyme. In (3b) we can see the nominative plural of this word, that is [krɛtɨ] *krety*. Here we have two syllables and what was a coda in (3a), that is [t], is now an onset. Such a change of syllabic status is known as resyllabification. All constituents, that is onsets, rhymes, nuclei and codas can consist of more than one segment and no restrictions are imposed on the number of segments in a constituent, e.g. in [strɪp] *strip* we have a ternary onset.

All in all, Generative Phonology offers an unlimited number of rules which can explain practically everything synchronically, even if the shape of some words is diachronically motivated. Also the features employed by the model seem to be too numerous. Finally, the syllabic structure appears to be unrestricted and commonsensical.

3. Government Phonology

This framework is a theory of representations. What it seeks is providing a highly restrictive and universal model composed of a few principles and describing all phonological phenomena on one level of representation. Thus, no rules or derivations are needed.

In particular, Government Phonology (from now onwards referred to as GP) regards phonological phenomena as reflecting a limited number of universal principles and language-specific parameters. The basic notion, that of government, is employed to show that governing relations are present in phonology. Government is viewed as an asymmetric relation between two skeletal slots, i.e. units of phonological timing. As regards the melody units, each segment is composed of one or more phonological primes or elements, each of which receives full phonetic interpretability.

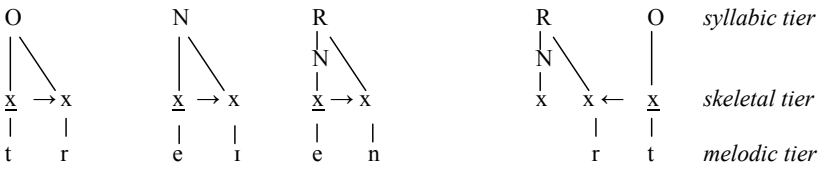
It is of utmost importance to note that the theory is extremely strict in choosing the phenomena which should be perceived as phonological. Specifically, all truly phonological processes must be caused by the contexts in which they take place. If no context for change can be detected, such a change cannot be treated as phonological.

3.1. Principles, Parameters and Magic

As already mentioned, GP uses a very limited number of universal principles and language-specific parameters. The most important of these principles are as follows. The Binarity Theorem states that all constituents, that is onsets, nuclei and rhymes, are maximally binary. The Strict Locality Condition and the Strict Directionality Condition ensure that governing relations between segments are local and directional.

Some segments are perceived to govern, while others to be governed. These assumptions are represented below (governors are underlined):

(4) a. CONSTITUENT GOVERNMENT b. INTER-CONSTITUENT GOVERNMENT

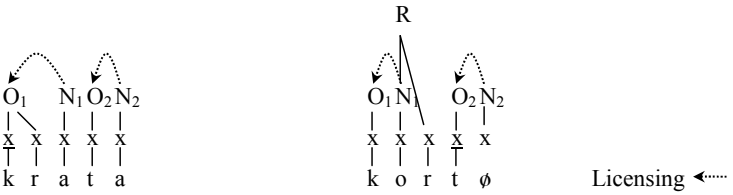


What we see above is a formal graphic representation of branching onsets (represented by the consonant cluster [tr]), nuclei (illustrated with the diphthong [eɪ], although every long vowel is also a branching nucleus) and rhymes (exemplified by the sequence [en]) as well as governing relations obtaining between skeletal positions. In (4b) the onset [t] governs the rhymal complement (also known as coda) [r]. Normally, obstruents are assumed to be governors, while sonorants are governees (see 3.2. below).

We also see that the phonological representation has three tiers: syllabic, skeletal, and melodic. The syllabic tier is reserved for syllabic constituents, the skeletal layer shows timing units (x's), while the melodic one displays segments. It goes without saying that constituents may dominate only one timing position. In such a case no constituent government is present.

The next important assumption is the Licensing Principle, according to which every position in the phonological representation of a word must be licensed by the head of the domain, which is normally the stressed nucleus. This nucleus distributes its licensing power to the other nuclei in the word and these, in turn, license the preceding onsets. Coupled with these is the Coda Licensing Principle, which states that every post-nuclear rhymal position (or coda) must be followed by an onset. This practically means that no word in any language ends with a coda. Consider these assumptions represented graphically:

(5) a. b.



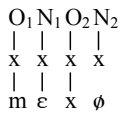
Above we observe two Polish words: [krata] *krata* – 'grille' and [kort] *kort* – 'tennis court'. In (5a) the nucleus (N_1) provides licensing to the governor of the preceding onset, that is to the stop [k]. The nucleus (N_2) also licenses the preceding onset (O_1). In (5b) the nucleus (N_1) licenses (O_1), while (O_2) is licensed by the empty nucleus (N_2). When a nucleus licenses a position of the governor which has to take care of its governee, such a type of licensing is frequently referred to as government--licensing or a licence to govern. We can also notice that in branching onsets sonority rises towards the following nucleus, e.g. [kr] in (5a), while in coda-onset clusters it falls towards the end of the cluster, e.g. [rt] in (5b).

A few other things deserve some comment here. First, the word [kort] physically ends with an onset, not a coda. Second, this word phonologically ends with an empty nucleus, which is a revolutionary assumption in phonology. Such a viewpoint results from observing the Projection Principle, due to which relations among segments are perceived as stable, no matter which version of a single word we deal with. Thus, whether we take [kort], [kortu] – gen.sg., [kort] – nom.pl. or any other paradigmatic case of *kort*, the liquid [r] will always belong to the rhyme, while [t] will always be an onset. The same goes for [krata], whose gen.pl. is [krat] *krat*. In both cases [t] is an onset. Practically, this means that there can be no resyllabification.

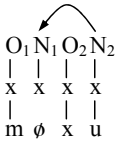
What needs to be mentioned here as well is one language-specific parameter, namely that concerning the ability of empty nuclei to stand at the end of the word and, consequently, to license the preceding onsets. In Polish, as we see in (5b), an empty nucleus is capable of licensing the onset [t] and any other onset. So, the parameter is ON. There are languages, however, in which this parameter is OFF (e.g. Italian and Japanese). In such tongues every word must end in a full vowel because only a melodically filled word-final nucleus is able to license the onset it follows.

Now let us turn to another form of government utilized by the theory, namely to Proper Government. This type of relationship is closely connected with the Empty Category Principle, which states that some positions within a word may remain silent if they are properly governed. This situation normally occurs in the case of word--medial nuclei which are phonologically present but phonetically absent. Consider the following examples:

(6) a.



b.



Looking at the representations of the Polish word [mɛx] *mech* – 'moss' in (6a), as well as at its genitive singular [mxu] *mchu* in (6b), two things have to be made clear. Firstly, it is assumed that, since there is no resyllabification, both the nasal [m] and the velar fricative [x] are attached to onset positions. Second, in (6b) the apparent root vowel [ɛ] is not realized phonetically, so [ɛ] from (6a) alternates with zero from (6b). This vowel-zero alternation can be easily accounted for by assuming that Proper Government is at work here. In particular, the filled nucleus (N_2) in (6b) allows the preceding nucleus (N_1) to remain mute. In (6a) there is no vowel under (N_2), so the vowel has to surface. All this is possible under the assumption that the sound [ɛ] is not a phonological vowel in Polish but an underlying empty nucleus which has to be phonetically present if there is no following vowel to let it stay silent.[6]

Thus, an empty nuclear position may be licensed to keep quiet in two ways: either by Proper Government if it is word-medial, or by parameter if it is word-final.

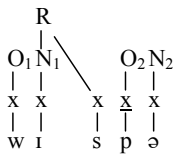
Another thing needs mentioning here as well. What we saw in (5a, b) above was that sequences of obstruents followed by sonorants, e.g. [kr] are viewed as branching onsets, while the same types of consonants in reverse order are assumed to be coda-onset sequences. There are also other consonant clusters whose structure should be looked at. For example, in Polish words such as [tkatɕ] *tkać* – 'to weave' or [ptak] *ptak* – 'bird', the word-initial clusters contain two stops which can be viewed neither as branching onsets nor as coda-onset sequences. Thus, they are considered to be two independent onsets separated by an empty nucleus and have a structure like that shown in (6b) above. Practically, all clusters of similar consonants are treated in this fashion unless there are language-specific (i.e. parametric) exceptions.

Finally, let us concentrate on sequences of the sound [s] followed by voiceless stops in word-initial position. Such a configuration occurs in a variety of languages and can be exemplified by words such as [stɒp] *stop*, [spiːk] *speak* (English), [staf] *staw* – 'pond', [skok] *skok* – 'jump' (Polish), and many other items of this sort. Moreover, one encounters three-sound combinations in many tongues, e.g. [strɪp] *strip* (English), [sklɛp] *sklep* – 'shop' (Polish). Such sequences cannot be branching onsets for a few reasons. First, the sonority of cluster-members is not normal since [s] (a spirant) is more sonorous than [p, t, k] (stops), which rules out all these clusters as branching onsets. Second, there is a binarity requirement on the number of x's in a constituent, which eliminates [spr, str], etc. What can be done, then? Above all, let us observe that clusters such as [sp, st, sk] occur not only word-initially, e.g. [wɪsk]

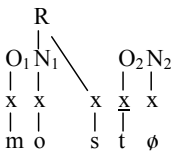
[6] In fact, there is another sound [ɛ] in Polish, which does not alternate with zero and which is a full vowel, e.g. [sɛr] *ser* – 'cheese' vs. [sɛra] *sera* – 'cheese-gen.sg.'

whisk, [lʌst] *lust*, [wɪspə] *whisper* (English), [most] *most* – 'bridge' [waska] *łaska* – 'grace' (Polish). Consider the representation of the words [wɪspə] and [most] below (the governing onsets are underlined):

(7) a.



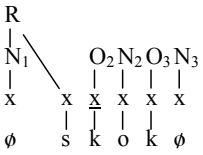
b.



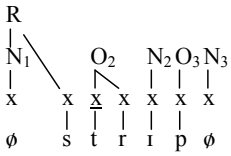
In (7a) we observe the medial cluster [sp] syllabified as a coda-onset structure with [p] governing [s]. There is no other logical possibility from the viewpoint of both the theory and common sense. Every speaker of English will say that [wɪs] is one syllable, while [pə] is another. In Polish we will also agree that the nominative plural [mostɨ] *mosty* is syllabified as [mos] and [tɨ]. We know as well that there is no resyllabification in GP, so both [most] in (7b) and [mostɨ] have the same structure.

Then, since clusters composed of [s]+stop are coda-onset sequences in word-medial and final positions, then it seems reasonable to say that they have the same structure initially. What follows [s] is either a single onset in groups such as [st, sp, sk] or a branching onset, e.g. [str, spl]. This is illustrated below:

(8) a.



b.



The only problem is the licensing o the nucleus (N_1) in both cases. What we remember is that empty nuclei are licensed by parameter as word-final or by Proper Government if medial. Here neither situation is illustrated. Thus, the concept of magic licensing is proposed for such occasions. This is an exceptional state since no other consonant than [s] cross-linguistically behaves this way. [7]

[7] In fact, magic licensing refers to all *s*-like sounds, i.e. those which are historically or contemporarily

3.2. Phonological Elements

In Government Phonology every segment contains one or more phonological elements or primes. These are the smallest units of representation which can be realized phonetically in isolation. For instance, the element (A), when interpreted alone, more or less corresponds to the cardinal vowel [a], while (A) combined with (U) represents the vowel [o]. Combinations of elements are parametric. First consider the following primes used to represent vowels:

(9)

ELEMENTS	A	I	U	COMBINATIONS	A, I	A, U
VOWELS	[a]	[i]	[u]		[e]	[o]

The elements from which vowels are made are also used to represent consonants, although there they determine only the place of articulation. Other primes contribute different properties to the consonants. Although the number of elements used for consonants may differ from analysis to analysis, we may assume the following collection:

(10) U – labial A – coronal @ – velar I – palatal ʔ – stopness h – noise
N – nasal L – lack vocal cords (voiced) H – stiff vocal cords (voiceless)

For instance, the Polish [b] will be represented by (U, ʔ, h, L), which means that it is a labial (U) stop (ʔ), which is also voiced (L) and characterized by noise (h). The voiceless counterpart [p] will lack the element (L) and will have the structure of (U, ʔ, h).

As a rule, obstruents (stops and fricatives) contain more elements than sonorants (liquids, nasals and glides) and this fact makes the former better candidates for governors in branching onsets or coda-onset sequences, as shown in (4) and (5) above.

The status the elements enjoy within a given segment may be unalike. Specifically, some elements are viewed as headed – more important for a given segment than the other primes. Headedness may also denote tenseness in vowels. For instance, the English lax [ɪ] is normally perceived as headless (I), while the tense [iː] as headed (I̲). If more primes make a segment, the asymmetry of headedness may mean differences in the phonetic quality, e.g. (A, I̲) = [e], while (A̲, I) = [ɛ] or [æ], depending on the vocalic inventory of a given system.

closely connected with [s], e.g. [z, ʃ, c].

As already said, both single primes and the combinations of elements are chosen parametrically, depending on the phonological system. So, the prime (A) may be realized as [æ] in English but as [a] in Polish. Combinations may differ as well, e.g. in Polish [p] equals (U, ʔ, h), while in English it is (U, ʔ, h, H). Whether headedness of elements occurs in consonants at all has to be established as a result of the phonological analysis of a given language.

3.3. Non-branching Government Phonology

In more recent analyses,[8] Government Phonology often employs only two constituents – Onset and Nucleus – both being non-branching. Thus, all segments are attached to either one or two skeletal positions. Formally, the following structures of long and short segments can be distinguished.

(11) a. SHORT VOWEL b. LONG VOWEL c. SHORT CONSONANT d. LONG CONSONANT

Short vowels (11a) and single consonants (11c) are associated with one skeletal slot. Long vowels (11b) are linked to two consecutive nuclei, whereas geminates (11d) are attached to two successive onsets.

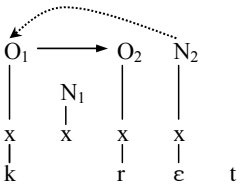
As for diphthongs, these are sequences of two vowels, each attached to one nucleus, while consonant groups are linked to two consecutive onsets. This is graphically represented below:

(11) a. SHORT VOWEL b. LONG VOWEL c. SHORT CONSONANT d. LONG CONSONANT

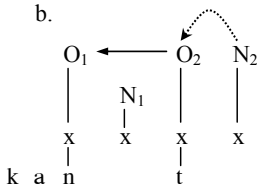
[8] E. Cyran, *Complexity scales and licensing strength in phonology,* Lublin 2003; K. Jaskuła, *Ancient sound changes and Old Irish phonology,* Lublin 2006.

Now, since there are no branching constituents, consonant clusters are perceived as sequences of onsets which may enter into interonset governing relations. Every relation of this type must be government-licensed by the nucleus which immediately follows it. In languages such as Polish, empty nuclei can government-license only certain types of consonant clusters, while full vowels are able to license a wider range of consonantal sequences. Generally, the licensing properties of nuclei are language specific. Using three Polish words, [krɛt] *kret* – 'mole', [kant] *kant* – 'edge' and [mɛx] *mech* – 'moss' (whose gen.sg. is [mxu] *mchu*), we can represent the possible governing relations as follows:

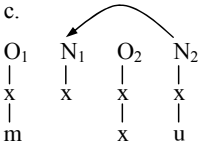
(13) a.



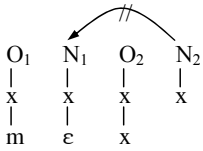
b.

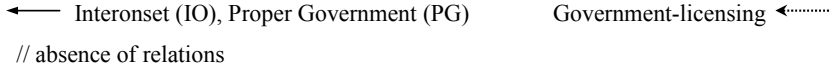


c.



d.





In (13a) and (13b) we can see two interonset governing relations, rightward and leftward, respectively. The word [krɛt] in (13a) exemplifies a governing relation between the onset (O_1) – the governor, and the governee (O_2). This relation is licensed by the nucleus (N_2), which contains the vowel [ɛ]. Note that the intervening nuclear position (N_1) is empty and plays no part in phonology. The word [kant] in (13b) illustrates a reverse situation, where the governor (O_2) follows the governee (O_1). This relation is also licensed by (N_2) which is empty but plays a role in phonology by being a licenser for the whole relation. The intervening nucleus (N_1) is empty and irrelevant to the structure. Such nuclei are referred to as 'buried' or 'locked'. In (13c) we can see Proper Government between the nucleus (N_2), which includes the vowel [u], and

the empty (N_1). Since the word [mxu] alternates with [mɛx] (13d), it is assumed that the underlyingly empty nucleus (N_1) can stay silent if it is properly governed by the following vowel.

What needs to be added is that consonant clusters are said to participate in interonset relations not incidentally. In particular, when we deal with a cluster composed of an obstruent followed by a sonorant, the relation will be from left to right. On the other hand, when a resonant precedes an obstruent, the relation will be from right to left. This is because obstruents are viewed to be typical governors, sonorants being classic governees.

It may also be said that in this version of the model there is no need to resort to magic. All word-initial sequences such as [sp, st, spl, str] etc., are treated like structures presented in (13) above, e.g. [sp] is like (13b), while [str] is like a combination of (13b) and (13a).

To sum up, the non-branching version of Government Phonology translates the governing relations occurring within or across syllabic constituents in the standard model into relations between constituents.

4. The Lateral Theory of Phonology and the Coda Mirror

This framework, although it is based on many Government Phonology tenets, may be viewed as a full-fledged and relatively independent theory of representations developed by Scheer [9] from an idea by Lowenstamm.[10] We should remember that the final version of the model is still to appear. As far as it stands at present, it is taken for granted that CVCV sequences are universal and, similarly to what we saw in the previous section, there are no branching constituents. The forces of Government and Licensing are at work too, but their functions are slightly different than in GP.

The Lateral Theory of Phonology (henceforth LTP) assumes that segments enter into lateral relations with other segments. These relations are caused by nuclei, although the effects may show up in both consonants and vowels. Consider the following examples where the English words [sʌmə] *summer* and [wɪntə] *winter* are used:

[9] T. Scheer, *A lateral theory of phonology Vol. 1: What is CVCV, and why should it be?* Berlin 2004.

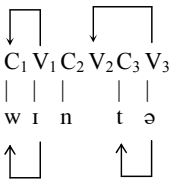
[10] J. Lowenstamm, *CV as the only syllable type*, In J. Durand and B. Laks (eds.) *Current trends in phonology. Models and methods*, Manchester 1996.

(14) a.

Government

Licensing

b.

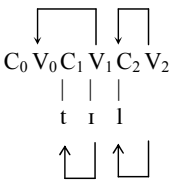


What can be observed in (14a) is that the forces of both Government and Licensing operate from vowels to consonants. In LTP Government weakens the melody of a segment, while Licensing supports its 'health'. Every V is obligated to both govern and license the preceding C and this is what both V_1 and V_2 do in (14a). There is at least one exception to this obligation, however, and this is shown in (14b). In particular, what occurs between C_2 and C_3 is an empty vocalic position, which has to be governed by V_3.[11] As a result, V_3 does not govern C_3 and this consonantal position is only licensed, i.e. it is very a 'healthy' and strong segment.

More generally, in the representations (14a, b) we can see that no onsets or nuclei are necessary for LTP. What is sufficient is consonants and vowels. Every consonant is attached to C, while every vowel to V. Long consonants and vowels simply straddle intervening empty positions, similarly to what we saw in (11b, d) above.

LTP introduces other revolutionary observations to phonology. One of these is the parametric occurrence of an empty CV unit word-initially, another is that all relations are from right to left, while yet another is that sonorants govern obstruents.[12] Consider the examples below, where it is assumed that English does have the initial CV sequence:

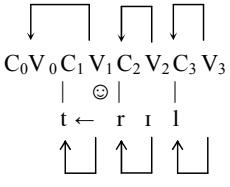
(15) a.



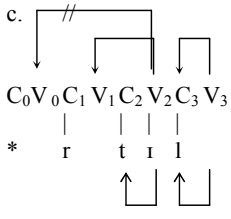
Government

Licensing

b.



c.



[11] This situation resembles Proper Government illustrated in (6b).

[12] The details of this assumption are too complicated to handle in a short text like this one.

In (15a) both V_1 and V_2 license the preceding C's; V_2 also governs C_2, so this consonant is exposed to both forces. V_1 has to (properly) govern V_0, as a result of which the initial stop [t] in [tɪl] *till* experiences only licensing, which makes it 'strong'. In (15b) [r] governs [t], which is indicated by the arrow (←). [r] is licensed and governed by V_2, which is a normal situation, while [t] is only licensed by V_1, which makes it 'healthy' in the word [trɪl] *trill* as well. What must be added is that the governing relation between [r] and [t] licenses the nucleus V_1, which is symbolized by ☺, as different from other empty nuclei, which are not sanctioned by an inter-consonantal governing relations and which have to be properly governed. ☺ is not governed, it licenses and governs by itself. Finally, there is the word *[rtɪl], which is incorrect in English. The fact that it is an impossible structure is predicted by the theory. Namely, since all governing relations are directed leftwards and since sonorants govern obstruents, [r] followed by [t] cannot (//) contract a relation which would make V_1 silent. So, V_2 has to properly govern it and, by doing so, V_2 cannot properly govern V_0. If a vocalic position is deprived of all the necessary forms of sanctioning, the whole structure is incorrect. Consequently, words such as *[rtɪl] cannot occur in English. As regards Polish, no empty CV sequence is present in words, so words like [rtɛɲtɕ] *rtęć* – 'mercury' or [rvatɕ] *rwać* – 'tear apart' are well-formed. Specifically, in a case like (15c) there is no V_0, so V_2 can safely govern V_1 and the whole structure is correct.

Returning to the 'health' or 'strength' of segments, LTP is particularly interested establishing the positions in a word where segments are more or less likely to occur or undergo changes such as weakening.[13]

Specifically, consonants can occur in either relatively strong or weak positions within a word and these positions may determine the possibilities of the consonants' weakening or remaining unchanged in languages where weakening takes place. To use the model-specific terminology, a consonant is relatively stronger if it occurs in the Coda Mirror, while it is comparatively weaker when it is in the Coda. Specifically, a consonant is in the Coda Mirror when it is word-initial before a vowel and when it is post-consonantal. In CM terms, where an empty CV unit initiating any word is assumed to occur, i.e. a word/morpheme boundary # = empty CV, these two contexts are identical in that the Coda Mirror consonant surfaces after a governed empty nucleus. This is presented below:

[13] The weakening or lenition of consonants does not normally occur in English or Polish, but it does in dozens of other languages such as Irish, Spanish, etc. Weakening normally means transforming a stop into a fricative or turning a voiced sound into its voiceless congener. Sometimes lenition is complete, i.e. the weakened sound disappears from pronunciation.

(16) a. #_V
b. VC._V
} ϕ_ Coda Mirror – strong position

On the other hand, a consonant occupies a Coda position when it is preconsonantal or word-final. According to CM, this consonant appears before a governed empty nucleus. This is shown in (17a, b) below:

(17) a. V_.CV
b. V_#
} _ϕ Coda – weak position

c. V_V non-Coda – intervocalic weak position

In addition, the position between two vowels, as in (17c), is also viewed by the model as a weak site although it has nothing in common with Codas.

As a consequence of adopting these theoretical assumptions, we can predict that weakening should first affect a consonant in either of the positions shown in (17a,b) or intervocalically (17c), while it will far less likely for a consonant to be lenited in the contexts shown in (16).

To illustrate how the position may influence the shape of consonants, Scheer provides examples of Latin obstruents which were left unchanged or altered in Modern French (the relevant consonants are emboldened):

(18)	***strong position (Coda Mirror)***	***weak position (Coda)***
LATIN → FRENCH		LATIN → FRENCH
a.		
p*orta*	→ ***p****orte*	*ru****p****ta* → *route*
d*ente*	→ ***d****ent*	*a****d****venire* → *avenir*
f*ame*	→ ***f****aim*	*facta* → *faite*
b.		
*tal****p****a*	→ *tal****p****e*	*lu****p****(u)* → *lu*
*ar****d****ore*	→ *ar****d****eur*	*nu****d****(u)* → *nu*

In the left-hand column the Latin consonants find themselves in the Coda Mirror, they are strong and, as they enter French, they remain intact, no matter whether they are word initial (18a) or occurring after another consonant (18b). In the right-hand column we see that the original Latin obstruents disappear altogether in French. This is because they are in the Coda position, be they before a consonant (18a) or word-final (18b).[14]

Obviously, the developments shown above occurred in stages over hundreds of years but synchronic processes of this sort can also be found. For instance, if we consider the word-final devoicing of Polish obstruents, which is an example of segment weakening, we realize that they are weakened in the Coda position shown in (17b). On the contrary, we will not expect a Polish obstruent to undergo devoicing in either of the contexts shown in (16).

As already said, languages do not have to make their segments weaker but, if they do, this weakening is going to take place in the Coda position, while the Coda Mirror position seems to guarantee the segments' security.

5. Conclusion

What has been presented in this paper is an extra-brief introduction to the basic concepts and mechanisms of Generative Phonology and Government Phonology as well as a sketch to the still incomplete Lateral Theory of Phonology. In all these theoretical models the aims are different and the appropriate tools are selected accordingly. Generative Phonology is primarily interested in transforming the abstract (phonological) representations of words into the concrete (phonetic) level. Government Phonology aims at discovering universal principles of syllable structure and rendering a single and comprehensive level of phonological representation governed by uniform mechanisms of government. The Lateral Theory of Phonology offers a simplistic syllable structure and seeks to find ways of interpreting this configuration. All these theories have their advantages and disadvantages and it is the analyst's role is to decide which model deserves greater plausibility.

[14] In fact, in words like *lu**p**u*, the obstruents were not final in Latin, but they became final after entering French.