A Users' Guide to Government Phonology (GP)

Notice to the reader

The following guide is a snapshot in time. It represents (mostly) my views on the basics of the theory of GP minus the evidence for why anyone should believe them. This evidence is to be found in the rather ample literature dating back some 20 years. Where major theoretical differences exist within the GP framework, I will try to indicate them but make no promises as to completeness. Any serious scientific theory is subject to constant change and many of the sections found in this guide may have been updated by the time this text falls into your hands. An access to the relevant articles, books, theses, conference papers, etc. is essential to following the latest currents within this field as well as any other. You being duly warned, I will now proceed to present the principal components of the theory of GP. Technical terms are **emboldened** when first presented. Their definition may be found later than their first appearance in the text.

Section I
Phonological representations

I. The **Elements**

E, the set of elements is defined below.

E = {A, I, U, H, L, ?[i]}

and an identity element, usually represented as "_" in **phonological expressions**. Each element is a monovalent, (potentially) interpretable phonological expression. Its actual interpretation depends on

i. what phonological **constituent** (see below) dominates it and

ii. whether it occupies a **head** or **operator** position within a phonological expression (see below).

The following examples illustrate each element with words serving as very rough indications of their value.

Element	Expression	Word
A	A	*f**a**ther*
I	I	*m**e***
U	U	*t**oo***
H	({H},_)	***h**orse*
L	({L,?},_)	*si**ng***
?	({?},_)	***g**o*
_	({},_)	*kiss**e**s*

The reader is reminded that the above table only a very rough guide to the pronunciation of the elements. He is referred to the literature where examples from a wide variety of languages abound.

II. Phonological Expressions

All speech sounds are phonological expressions. A phonological expression is defined as an ordered pair

$$\text{Phonological Expression} = (O,H)$$

such that:

i. $O \subseteq E$ (O possibly empty)
ii. $H \in E$ (possibly the identity element)
iii. $H \notin O$

By convention, the first member of the ordered pair is called the operator(s), the second, the head of the phonological expression. Expressions headed by the identity operator are called **headless**. All other expressions are called **headed**. The head of an expression is said to **license** its (set of) operators.

III **Licensing Constraints**

Licensing constraints are defined at **L-Structure** (lexically). They are the language-specific combinatory laws on phonological expression for that language. At this time very little is known about licensing constraints for **onsets**[ii] but licensing constraints for **nuclei** have been well studied. Licensing constraints work as follows:

> Assume any phonological expression is grammatical unless specifically excluded by a licensing constraint.

In practice, only the elements A, I and U have been utilised in the formulation of licensing constraints.[iii] Some examples follow:

English Licensing Constraints (**branching nuclei**)

i. All expressions are headed.
ii. I and U may not combine.
iii. Nothing can license I.

These licensing constraints generate the following phonological expressions:

({},A)	f*ar*
({},I)	f*ee*
({},U)	t*oo*
({A},I)	p*ay*
({A},U)	f*oe*
({U},A)	s*aw*

Finnish Licensing Constraints

i. All expressions are headed.
ii. Nothing can license U.

These licensing constraints generate the following phonological expressions:

({},A)	*a*
({},I)	*i*
({},U)	*u*
({A},I)	*e*
({A},U)	*o*
({I},A)	*ä*
({I},U)	*ü*
({A,I},U)	*ö*

Note that the Finish licensing constraints are identical to those defining the set of French final stressed nuclei.

These licensing constraints generate the following phonological expressions:

({},A)	t*a*s
({},I)	p*i*s
({},U)	f*ou*
({A},I)	id*ée*
({A},U)	*eau*
({I},A)	l*ai*t
({I},U)	v*u*
({A,I},U)	p*eu*t

Mandarin Licensing Constraints[iv]

i All expressions are **simplex** (no more than one (non-null) element.
ii Nothing can license I.
iii Nothing can license U.

({},I)	ňı
({},U)	m̌u
({},A)	m̌a
({A},_)	ǩə

IV “Consonantal” Representations

The following is an example of phonological expressions found in onsets (Mandarin: provisional)[v]

Expression	Pinyin
({H,ʔ},U)	p
({ʔ},U)	b
({L,ʔ},U)	m
({H},U)	f
({U},_)	w
({H,ʔ},A)	t
({ʔ},A)	d
({L,ʔ},A)	n
({A,ʔ,H},_)	c
({A,ʔ},_)	z
({A,H},_)	s
({A},_)	r
({A},ʔ)	l
({I,H,ʔ},A)	q
({I,ʔ},A)	j
({I,H},A)	x
({I,A,ʔ},L)	n^{yvi}
({I,A},ʔ)	l^{y6}
({I},_)	y
({H,ʔ},I)	ch
({ʔ},I)	zh
({H},I)	sh
({U,H,ʔ},I)	ch^{w6}
({U,ʔ},I)	zh^{w6}
({U,H},I)	sh^{w6}
({H,ʔ},_)	k
({ʔ},_)	g
({H},_)	h
({U,H,ʔ},_)	k^{w6}

({L,?},_)	ŋ
({U,?},_)	g^{w6}
({U,H},_)	h^{w6}

Section II

Constituent Structure

I. The Phonological String

A phonological string consists, in part, of a series of positions indicated by a "x" as shown below.

$$x_1\ x_2\ x_3\ x_4\ x_5\ x_6$$

The positions are indexed as shown above, conventionally from left to right. We can define a relationship of **adjacency** between 2 positions as follows:

Given the string

$$x_1\ x_2 \ldots x_n \ldots x_z$$

x_n is adjacent to to the positions x_{n-1} ($n-1 > 0$) and x_{n+1} ($n+1 \leq z$)

The series of positions is called the **skeleton** (of a phonological string). Each position is referred to as a (**skeletal) point**. The skeleton is organised to a hierarchical structure known as constituent structure.[vii] Skeletal points are conserved throughout a **phonological derivation** with the exception of the effects of the **concat** function which is discussed below.

I The Constituents

There are 3 constituents in phonology: onset, nucleus and **rime**. They are subject to the following universal principles:

- Every nucleus can and must license a preceding onset.
- Every onset must be licensed by a following nucleus.

Furthermore we require that

Every constituent licenser must dominate a skeletal point.

Given the above, we derive the following:

Every nucleus must dominate a skeletal point.

Structures (a) and (b) are licit but (c) is ill-formed:

$$\begin{array}{lccclccclcc} \text{a)} & O & N & & \text{b)} & O & N & & \text{c)} & O & N \\ & | & | & & & & | & & & | & \\ & x & x & & & & x & & & x & \end{array}$$

The rime and nucleus are related as follows:

i. Every rime must dominate a nucleus along its head path.
ii. Every nucleus must be dominated by a rime.

The meaning of head path will be made clear below.

III. Constituent Domains

Any two positions dominated by a single constituent contract a **governing** relationship. A government relationship is a binary, asymmetrical relationship consisting of a **governor** and a **governee**. This relationship is subject to 2 universal constraints:

- **Strict Locality**
- **Strict Directionality**

We further stipulate that constituent government is head-initial (i.e. the direction of government is from right to left.

Strict locality means the 2 positions in the (constituent) governing relationship are adjacent at the P_0 projection (the project on which all positions of a phonological string are present.

Strict directionality means that the direction of government (head-initial) is not subject to parametric variation.

The Binarity Theorem

No constituent may dominate more than 2 positions.

This theorem is easily proved by showing that any constituent having 3 members must violate strict directionality, strict locality or both. Then by induction, any string with more than 3 members must contain a substring of 3 members which, as we have said, violates the conditions for being a constituent.

The singleton position of a constituent is also called the head of the constituent although it has no (constituent) governing role.

Given these constraints the following structures exhaust the possibilities of constituents in any human language. The constituent head is emboldened.

A. Nuclei

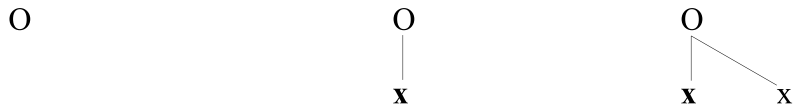
1. Non-Branching (1 position) 2. Branching (2 positions)

B, Rimes

1. Non-Branching (1 position) 2. Branching (2 positions)

C. Onsets

1. Empty (0 positions) 2. Non-Branching 3. Branching



IV **Transconstituent** Government

The formal properties of constituent domains were dealt with immediately above. This covered the cases of 2 strictly local positions *in the same constituent*. I now turn to the case of 2 adjacent positions *in different constituents*. These are cases of transconstituent government. As with constituent government defined above, transconstituent government is subject to

1. **Strict Locality**
2. **Strict Directionality**

as defined above. Transconstituent government is *head-final*; the direction of government is from right-to-left. Transconstituent government is, in some sense, a mirror image of constituent government. We shall see that the governing properties of heads and governees are different. It is the case that any well formed branching onset when reversed is a well formed transconstituent governing domain. E.g. the branching onset in English *pl*ay (pl) when reversed (lp) is a possible transconstituent domain as in English he*lp*.

V. Properties of Governing Domains[viii]
Heads of Branching Onsets: conjecture - A, I or U headed.
Known onset heads:

Expression	Letter	Language	Example
({H,?},U)	p	English	‘plant’
({H,?},A)	t	English	‘track’
({H,?},_)	k	English	‘cling’
({?},U)	b	English	‘brick’
({?},A)	d	English	‘drain’
({?},_)	g	English	‘gleam’
({H},U)	f	English	‘flea’
({H},A)	θ	English	‘throw’
({L,?},U)	b	French	‘branche’
({L,?},A)	d	French	‘drap’
({L,?},_)	g	French	‘glace’
({L},U)	v	French	‘vrac’
({L},A)	D	Greek	‘δραμα’
({L},_)	γ	Greek	‘γραμμα’
({H},_)	χ	Greek	‘χλιδη’

As of now there is not completely satisfactory formal characterisation of onset heads.

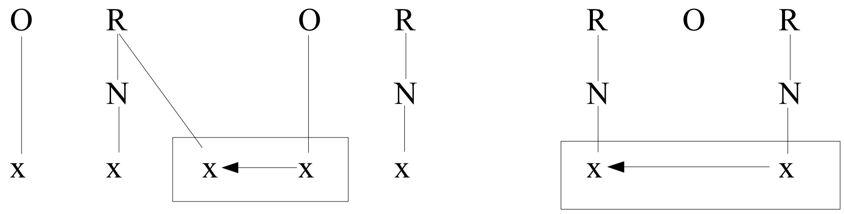
Governees of branching onsets: simplex or ?-headed, e.g. ({A},?), ({U},?).

Heads of branching nuclei: Contain the element A
Governees of branching nuclei: Do not contain the element A

Complexity[ix]: An expression x may govern an expression y if $N_x \geq N_y$ (where N = the number of features in the expression.

A governs not-A. An expression containing A will govern an expression not containing A

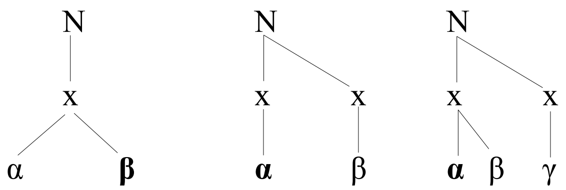
Transconstituent Government



Governing properties: both contexts are subject to Complexity, and A governs not A if complexity is equal.

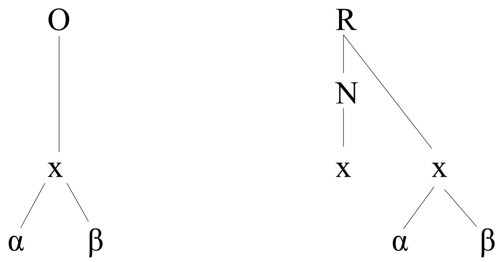
VI. **Diphthongs**

A diphthong is a nucleus containing two phonological expressions. A **light diphthong** has 2 phonological expression associated to a single position. A **heavy diphthong** has 2 phonological expressions associated to 2 distinct positions (branching nucleus).



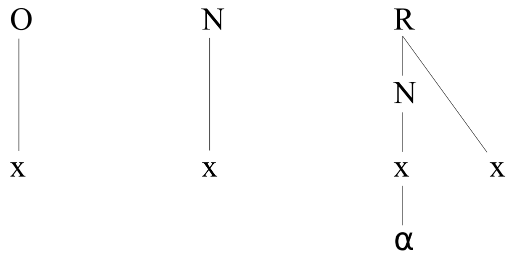
(heads of constituents are emboldened).
Head of light diphthong: no general requirement
Governee of light diphthong: simplex, no A

Conjecture: Only nuclear heads can license light diphthong structures. The structures below are not attested and I believe they do not exist.



Section III
Empty Categories

An empty category is a skeletal position with no phonological material.



An empty category is interpreted according to the **Empty Category Principle** (**ECP**).

The Phonological ECP: *A p-licensed (empty) category receives no phonetic interpretation.*

P-licensing:
1. Domain-final (empty) categories are p-licensed (parameterised).
2. Properly governed (empty) nuclei are p-licensed.
3. Magic licensing: *s+C* sequences p-license a preceding empty nucleus.

Proper government:

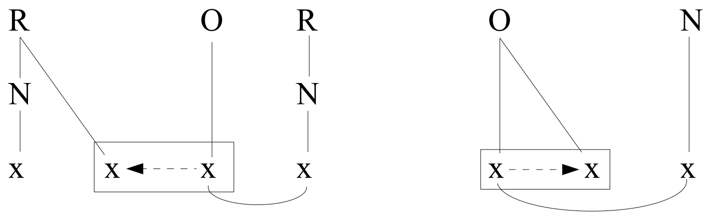
α properly governs ß if

1. α and ß are adjacent on the relevant projection,
2. α is **not itself** licensed, and
3. Neither α nor ß are **government licensers.**

Government licensing[x]:

A nuclear position is a government licenser if its onset governs a preceding rimal complement (**direct government licensing**).

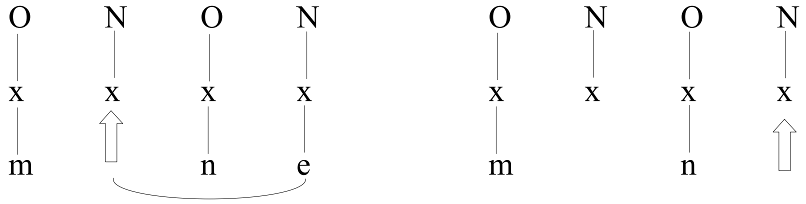
A nuclear position is a government licenser if its onset is the head of a branching onset (**indirect government licensing**).



DIRECT INDIRECT

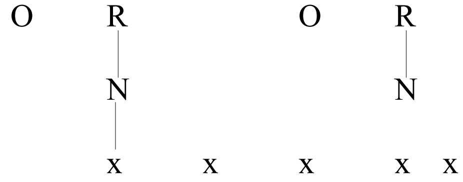
The nuclei on the right government license their onset heads to govern a rimal complement (direct government licensing) and the head of a branching onset (indirect government licensing).

Typical P-licensing cases



mener [mne]

mène [mɛn]



These examples come from the French verb *mener* ‘to lead’. In the first example (the infinitive) the final nucleus is not empty and can properly govern the preceding one. The second example is a singular inflected form with a final empty nucleus. This nucleus is P-licensed by virtue of being in domain-final position and receives no phonetic interpretation. The preceding nucleus, also empty, cannot be properly governed by the final nucleus. The final nucleus is P-licensed and cannot be a proper governor. The first nucleus in not P-licensed and is interpreted as [e]. The third example exhibits “magic licensing” using the English word “ski”. The transconstituent sequence “sk” P-licenses the preceding onset which receives no phonetic interpretation.

Illicit Proper Government Configurations

NOTES

iJensen (19??) has argued that ʔ is not an element but rather a consequence of constituent structure.
iiBut cf. Ploch (19??) for some discussion.
iiiRecent work on tones (Kaye, in prep) now include licensing constraints involving H and L. Ploch had also used L in licensing constraints involved in “nasalisation”.
ivRecall that licensing constraints apply at L-Structure. Non-lexical structures may appear in the course of a **derivation**.
vThis table has not been generated using onset licensing constraints. As stated above this are still poorly understood and need further work. As stated above, our current knowledge about licensing constraints extends only to nuclei. This table is provided only to give the reader an idea of how these elements may be interpreted in an “onset setting”.
vi This segment does not occur in standard pinyin transcription. The phonology of Mandarin makes it clear that this segment is required. (Cf. Goh, 1997).
viiThis corresponds roughly to what is known as “syllable structure” in other frameworks. As we shall see GP does not recognise the syllable as a constituent.
viiiMuch work needs to be done in this area. What is reported here is both provisional and incomplete.
ixCf. Harris (1990).
xSee Charette (19??).