

CODA CONDITION IN ITALIAN AND UNDERSPECIFICATION THEORY

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ABSTRACT

In Italian syllable coda licenses only a skeletal slot, associated with a small set of consonants. The coda condition which filters the segments admitted in this syllable constituent has to be sensitive to the manner as well as to the place of articulation. According to Underspecification Theory, [coronal] is assumed to be the unmarked place of articulation. Therefore, the coda condition would simply mark as [cont] the segment associated with that position.

CONSONANTS IN CODA

Like many other natural languages, Italian shows asymmetric distribution of segments in Coda with respect to the Onset, since the latter is much richer than the former, both regarding the number and kind of segments involved. The reasons for such asymmetry are both phonetic and phonological. Phonetically, we should consider at least the different degree of muscle tension as well as the strength of articulation. Phonologically, the typological studies carried out since Jakobson have documented the greater diffusion of the onset constituent over the coda (the well-known universality of the CV syllable).

In the syllable structure of Italian, the onset can be empty (e.g. *a.mico* "friend") or filled by one or two consonants (e.g. *pa.ne* "bread", *tre.no* "train"). The coda also can either be empty (e.g. *fi.ni* "(he) finished") or it projects on the skeletal tier a position, which may be filled by a glide, in case of a falling diphthong (e.g. *pau.sa* "pause") or by a small set of consonants (see Nespor [1] for a general sketch of the Italian syllable template). We will consider here only the consonantal codas, in order to find an auto-segmental condition which could represent the constraints available in the language.

The consonants admitted in coda are the following:

- a. dental liquids; e.g. ['salto] "jump",
['pɛrla] "pearl", ['kɔrpo] "body"

- b. dental sibilant; e.g. ['asta] "pole",
['vɛspa] "wasp";
c. homorganic nasals; e.g. ['kampo]
"field", ['dɛnte] "tooth";
d. the first half of a geminate; e.g.
['fet:a] "slice", ['pɛ:lɛ] "skin".

To capture significant generalizations from this picture is not simple, since the segments occurring in coda do not seem to form a natural class in terms of traditional phonological features.

A FIRST CODA CONDITION

Considering the articulation manner, we find that a formulation of the Coda Condition in terms of the features [snrt] and [cont] cannot exhaustively account for the linguistic data.

Itô [2] proposes the following filter for the coda in Italian:

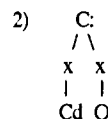
- 1) * C \$
|
{ [-snrt]
[-cont] }

But such a filter is incorrect, since it allows all liquids and nasals, which are [+snrt], while in actual fact only the dental [l r] are found, and not even the palatal /ʎ/. On the other hand, the occurrence of /s/ is predicted, since it is [+cont], but also that of the other fricatives of Italian, i.e. /v ʃ/, which do not occur in coda position. Moreover, it is unclear why the nasal in coda has to be homorganic with the subsequent consonant; e.g. ['kampo] "field", not *['kanpo], ['baŋka] "bank", not *['banka]).

As to /ʃ ɲ ʎ/, there are arguments for claiming that these consonants are underlyingly long. Firstly, they cannot form consonant clusters with other segments (e.g. *-VrʃrV/, *-VɲrV/). Secondly, /ʃ ɲ/ select the allomorphs ending with vowel of the article and other determiners (e.g. [lo 'ʃ:ɛ:mo], *[il 'ʃ:ɛ:mo] "the fool", [kwel:ɔ 'ɲ:ɔ:mo] "that gnome"); the palatal liquid can occur only

in internal position of the word (e.g. ['fi:l:ɔ] "son", but *['λ:ɔ]). Therefore, the treatment of these segments should be considered part of the more general case of geminates.

The intrinsically heterosyllabic nature of a geminate allows it to occupy the coda constituent. In fact, in non linear phonology, a geminate projects two skeletal slots, the first one associated with the coda and the second one with the following onset; i.e.:



Given this representation, each geminate segment occurring in the language can fill the syllable coda, since in this case the phonological content of the coda constituent is totally governed by the onset.

As far as the rule order is concerned, a filter like 1) should follow the syllabification by default of a long consonant as in 2). However, with a negative condition such as that formulated in 1), it is still impossible to explain the lack of fricatives other than /s/ in coda or the constraint on homorganicity holding for nasals.

UNDERSPECIFICATION

If we once again consider the inventory of segments allowed in coda, we observe that, apart from geminates and nasals, all other segments share the same point of articulation, i.e. they all are dental. In terms of articulatory features, they are marked [+coronal] and [+anterior]. Inside the feature geometry, the Coronal node is assigned a special status by the Underspecification Theory, both Radical and Contrastive: Coronal is assumed as the unmarked Place of Articulation. This hypothesis is supported by different arguments: a) coronal segments are normally present in the inventory of natural languages; b) the number of coronals in a language is normally higher than that of other points of articulation; c) in language acquisition anterior coronals appear early; d) they show a special behaviour in phonological processes, as they are often assimilated and, at the same time, transparent to vowel harmony; e) in linguistic errors,

especially in the case of substitutions, coronals are involved more often than segments in other articulation places. All these data together indicate that the coronal place is special, i.e. it is unmarked (see [2] and [3]).

The basic idea of Underspecification Theory is that the underlying representation (UR) shows only the relevant information, while redundant values and unmarked features are excluded. Among coronal segments, only the anterior ones (i.e., dental or alveolar consonants) are recognized as unmarked for Place at the level of UR.

In Italian, there are two series of coronal segments: the dental /t d s tʃ dz l r n/ and the palatal /tʃ dʒ ʃ ɲ ʎ/. Only the first ones are anterior and therefore they can be assumed as being unmarked for Place of Articulation.

According to the Underspecification Theory, we could assume that in Italian only segments unmarked for Place in UR are licensed in coda. The corresponding filter would have the following form:

- 3) * C \$
|
Pl Art

With such a negative condition, all segments of the anterior coronal series would be possible in coda position. But, again, this would not be correct, since dental plosives and affricates, both [+cor] and [+ant], are not allowed in coda position, unless they are geminates. Something else is then necessary in order to exhaustively capture the data of the language.

A SECOND CODA CONDITION

Baroni [4] has recently proposed a Coda Condition which, assuming the underspecification for Place of anterior coronals, prevents the occurrence of dental stops and affricates by the addition of the feature [stop]; formally,

- 4) * C \$
|
Pl Art
[+stop]

Baroni rejects the traditional feature [cont] and instead introduces two distinct features, [stop] and [fricative].

This hypothesis is grounded partly on the analysis by Lombardi [5], who refu-

ses a representation of the affricates as contour segments with two ordered values of the feature [cont], since this representation would not be able to interpret some relevant phonological processes occurring in natural languages. Lombardi proposes to replace [-cont] with [stop], maintaining the [+cont] feature, while Baroni claims also the substitution of [+cont] with [fricative].

The introduction of two features instead of the more traditional [cont] allows to keep separate the different obstruents of the dental series: /t d/ will be marked by [stop], /s/ by [fricative] and /ts dz/ by both these features. However, such an hypothesis, which appears to be supported only by the representation of affricates as complex segments, is rather expensive in the phonological analysis. Since Baroni follows the framework of Radical Underspecification, he is obliged to represent the affricates as marked by two different features; but, in Contrastive Underspecification, a same feature can receive a different value, even at the UR level too.

On the other hand, apart from obstruents, the new features could not be applied, while [cont] is relevant even in the interpretation of other segments. Moreover, the representation of affricates as complex segments with two unordered features, [stop] and [fricative], does not hold for the palatal series, where, besides /tʃ dʒ/, there are not palatal stops in Italian. For palatal affricates, it would be necessary to postulate - as Baroni does - a redundancy rule which assigns the values [+stop, +fricative] to the coronal segments [-ant] which are unmarked by other features in UR, with a conflation of the component relative to the derivation.

Finally, with the introduction of [stop] and [fricative], a coronal plosive like /t/ must be marked by [stop] in the UR, in order to be opposed to the fricative /s/ on one hand and to the affricates on the other; at the same time, the other plosives, /p/ and /k/, have to be marked for place, by [labial] and [dorsal], respectively. In this way, since all the stops are marked by at least one feature in UR, coronals risk losing their special status of being consonants more underspecified than the others.

As a consequence of the afore mentioned arguments, we do not agree with the proposal of rejecting [cont] in favour of two different features, [stop] and [fricative].

A NEW CODA CONDITION

Another Coda Condition for Italian can be formulated, a condition which takes into basic account the feature discussed up to now. Sharing the hypothesis of anterior coronals as unmarked for Place in UR, we propose that the segment associated with the coda position has to be marked [+continuant]. The underspecification for Place of anterior coronals on one hand and the constraint on [cont] on the other lead to the following filter:

5) * C \$
|
Pl Art
[-cont]

Such a negative condition predicts that the consonants admitted in coda have to be marked by the positive value of [cont], but, at the same time, the point of articulation in UR must be absent.

To assume [continuant] as the feature constraining the segments licensed in coda position entails the marking of this feature at the level of UR. As we saw, the adoption of [cont] is problematic for the representation of the affricates in Radical Underspecification, where only one value for each feature is admitted. This is not the case in Contrastive Underspecification, where the same feature can assume different values in UR in relation to the specific contrasts occurring in the language.

In the framework of Contrastive Underspecification, an affricate like /ts/ can be represented with reference to [cont] either as a contour segment (see 6a) or as a complex segment (see 6b):

6a)	/ts/	6b)	[-cont]
	x		x
	/ \		
	[-cont] [+cont]		[+cont]

The dental affricates will be kept distinct from the fricative /s/, which is only [+cont] and from the stops /t d/, which are only [-cont].

LICENSING

However, the Coda Condition formulated in 5) as a filter is able to license directly /s l r n/ as possible codas. It should be underlined that we assume that nasals segments are marked as [-cont], like liquids and fricatives. Such a mark does not imply the absence of some occlusion in their articulation.

We have now to interpret the homorganicity constraint on nasals as well as the occurrence of geminates in coda position. In both cases, we believe it is relevant to make reference to the notion of licensing as formulated in Goldsmith [7]. The basic assumption is the recognition of the coda as a secondary licensor with respect to the other syllable constituents, i.e. onset and nucleus. The reduced autosegmental potential assigned to this syllable constituent accounts for the fewer contrasts available in coda, as to those possible in onset. As regards the topic under examination, the coda crucially does not licence a point of articulation autosegment.

In other words, in Italian, as in many other languages, the coda licenses only a skeletal slot, associable with a small subset of features, which do not include those relative to place. Thus, consonants that appear in coda position may receive by default an unmarked point of articulation, i.e. they must be coronal or can be filled by the autosegmental content of a following onset.

In the case of the nasals, we assume that a nasal licensed in coda is underlyingly coronal. For Italian, such an interpretation is supported by the occurrence only of /n/, and not of other nasals, in word final position in functional, clitic elements, such as prepositions (e.g. *in* "in", *con* "with") as well as in determiners, like articles and adjectives (e.g. *un* "a, an", *nessun* "no, not any"). The homorganicity constraint on nasals may be directly derived from their syllable position: in coda, a nasal cannot license an autonomous point of articulation. Therefore, it is either coronal or it assumes the place of the following consonant in onset. Even homorganic nasals thus appear to respect the Coda Condition formulated in 5).

Regarding geminates (palatals /ʃ ʒ/ included), we saw already that they

project two skeletal slots, which are associated by default with different syllable constituents: the first slot goes with the coda, while the second one with the following onset (see 2) for the formal representation). Since in the case of a geminate the coda is licensed by the following onset, its position is basically empty, i.e. without phonological content. The coda becomes filled by the autosegmental spreading of all the features from the onset position.

The syllabification by default of geminates entails the possibility for these segments to occupy the coda position. At the same time, their special licensing from the onset position allows segmental features normally not permitted in coda to be present in this position. For instance, in Italian the feature [-cont] is prevented from occurring in coda by the Coda Condition we proposed (see 5). However, it may mark a coda position in the case of a long consonant (e.g. ['fet:a] "slice", like ['fa:ʃ:a] "band").

In such a perspective, geminates once again must be syllabified before the Coda Condition, which in fact does not apply to long consonants. After the syllabification of the geminates by default, as in 2), the filter given in 5) will apply to the segmental strings.

REFERENCES

- [1] Nespor, M. (1993), *Fonologia*, Bologna: il Mulino.
- [2] Itô, J. (1986), *Syllable theory in prosodic phonology*, Ph.D. Thesis, University of Massachusetts.
- [3] Paradis, C. & J.F. Prunet (1991), (eds.), *The special status of coronals: internal and external evidence*, New York: Academic Press.
- [4] Marotta, G. (1993), "Dental stops in Latin: a special class", *Rivista di Linguistica*, vol. 5, pp. 55-101.
- [5] Baroni, M. (1993), "Teorie della sottospecificazione e restrizioni sulle code consonantiche in italiano", *Rivista di Grammatica Generativa*, vol. 18, pp. 3-59.
- [6] Lombardi, L. (1990), "The nonlinear organization of the affricate", *Natural Language and Linguistic Theory*, vol. 8, pp. 375-425.
- [7] Goldsmith, J. (1990), *Autosegmental and metrical phonology*, London: Blackwell.