

Parviz Birjandi and Mohammad Ali Salmani-Nodoushan.
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Phonetic Features

Phonetics and Phonology
Week 6

Summarized by: A.B. Nugroho

Introduction

Traditional phonetics was inadequate in a number of cases.

For example, the phoneme /p/ has two allophonic realizations [p], and [ph].

Vowels, too, can mix to form diphthongs or triphthongs.

However, the naming convention used in traditional phonetics could not easily capture these nuances.

Therefore, phoneticians sought to develop a new comprehensive and exhaustive system.

This new perspective on phonetics was called systematic or modern phonetics.

Systematic Phonetics

Sound segments, in systematic phonetics, are said to be composed of bundles of features.

In fact, the identification of sound segments on preceding features is based on the binary features of those sounds that we have put within square brackets.

Modern phonetics is based on the idea that each phonetic segment or phoneme is composed of a bundle of features.

These features provide a good description of the phoneme. As such, phonemes are **distinguished** from one another on the basis of their *phonetic features*.

The **presence** of a feature in the bundle of features that identify a phoneme is marked by the plus **[+]** symbol and the **absence** of the feature by the minus **[-]** symbol.

Therefore, the phonetic features used in modern phonetics are called **binary features** due to their dual **[±]** values.

For example, the allophone [p^h] is said to be [+aspiration] whereas its allophone [p] is identified as [-aspiration].

/p/

- vocalic
- +consonantal
- voice
- +abrupt release
- +anterior
- coronal

/f/

- vocalic
- +consonantal
- voice
- +strident
- coronal

/θ/

- vocalic
- +consonantal
- voice
- +continuant
- strident
- +coronal

/t/

- +consonantal
- vocalic
- voice
- +abrupt release
- +coronal

/s/

- +consonantal
- vocalic
- voice
- +strident
- +anterior
- +coronal

/ʃ/

- +consonantal
- vocalic
- voice
- +strident
- +continuant
- +coronal
- anterior

Vocalic vs Consonantal

There are a number of phonetic features. However, two of them are considered to be the most crucial ones:

- a. [±consonantal], and
- b. [±vocalic].

Their importance is in that they classify all sounds into the four major sound classes:

- | | |
|---------------|-----------|
| a. Consonants | c. vowels |
| b. Liquids | d. glides |

Voice

A sound is described as **[-voice]** when the vocal cords **do not vibrate** during its articulation. If the vocal cords **do vibrate**, the sound is considered **[+voice]**.

The vocal cords vibrate when they are closed to obstruct the airflow through the glottis. They vibrate under the pressure of the air being forced through them by the lungs.

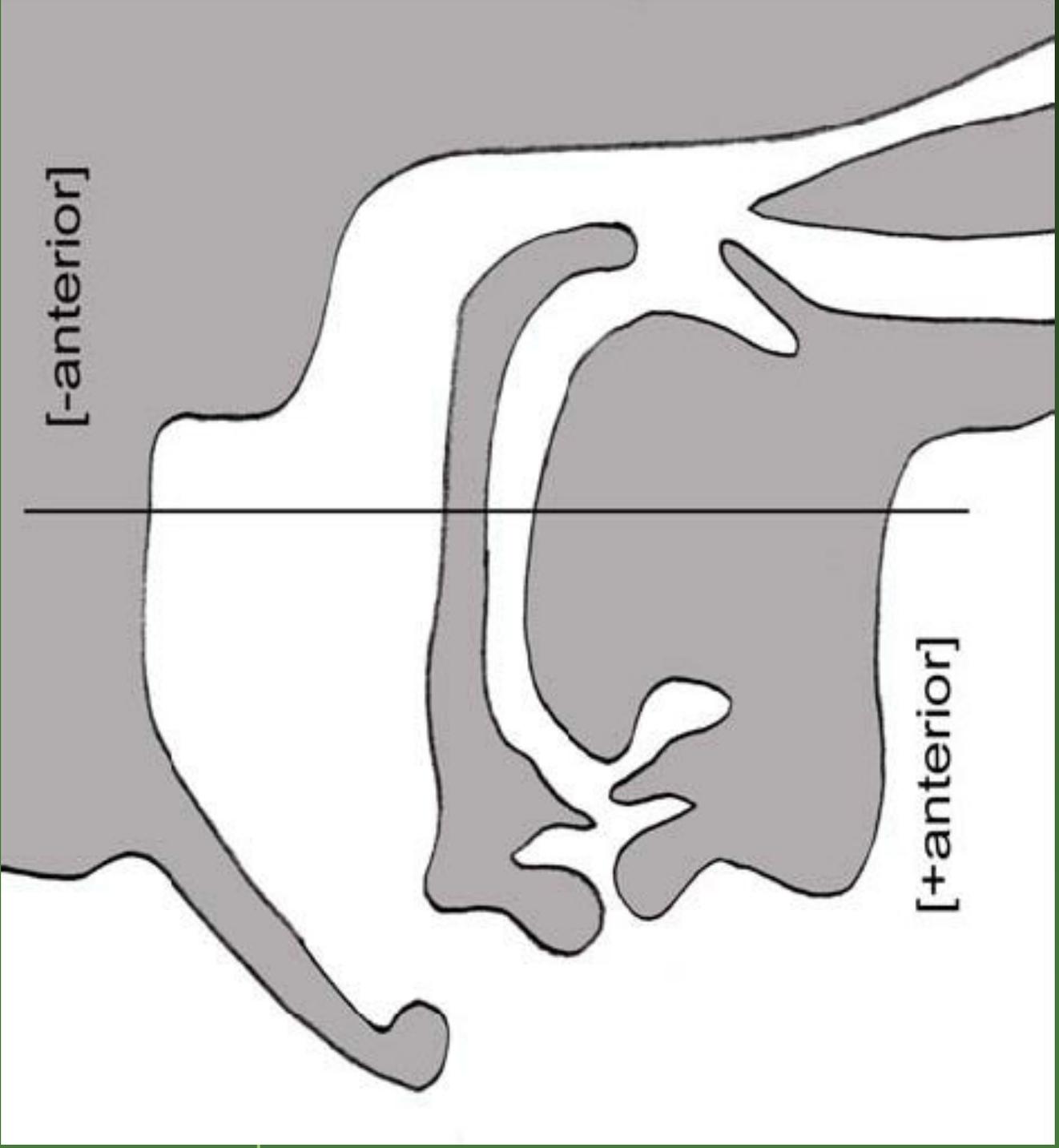
The **[±voice]** opposition is mainly useful for the classification of consonants. In English, the phonemes /tʃ/, /s/, /p/, /k/, /f/, /ʃ/, /t/, /θ/, and /h/ are **[-voice]**. Other phonemes are **[+voice]**.

Anterior

The feature [anterior] is related to the place or position of articulation of phonemes.

Any phoneme which is articulated at a position closer to the frontal parts of the mouth is [+anterior]; any phoneme articulated at a position closer to the dorsal (or the posterior) parts of the mouth is considered to be [-anterior].

As the figure below shows, all bilabial, labio-dental, dental, alveolar, and palatal sounds are [+anterior]. In contrast, all palato-velar, velar, velo-uvular, uvular, pharyngeal, and glottal sounds are [-anterior].



Coronal

Like the feature [anterior], the feature [coronal], too, is related to the place or position of articulation of phonemes.

The feature [coronal], however, shows whether the **tip and the blade of tongue are involved in the articulation** of phonemes or not.

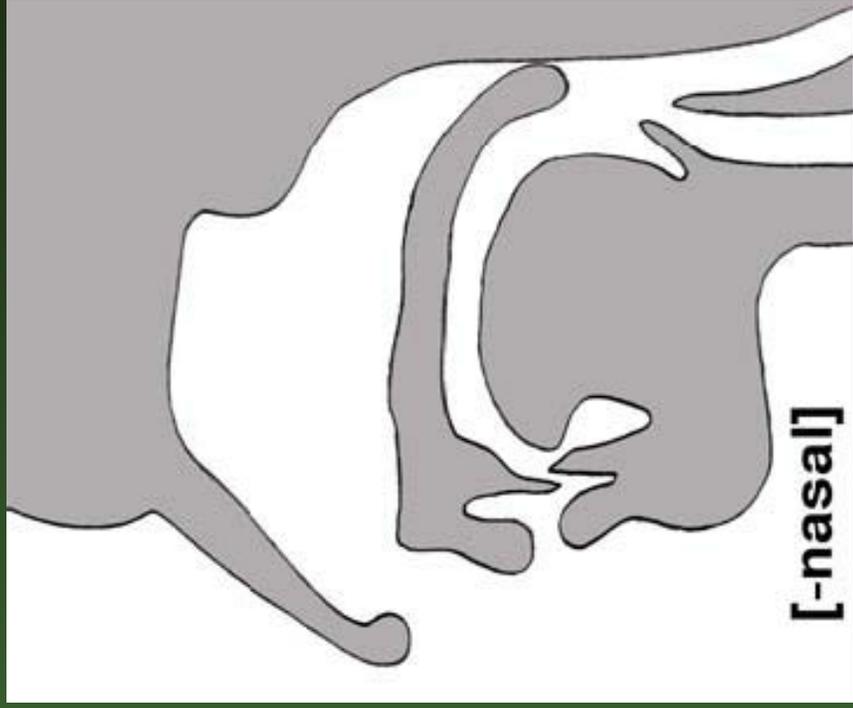
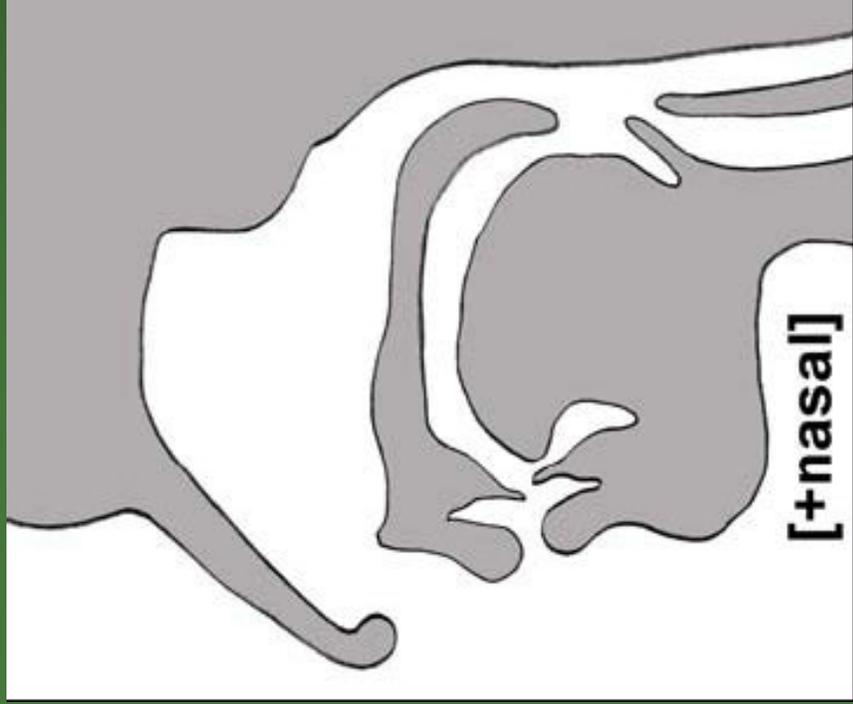
Any phoneme which is articulated by the involvement of the tip (i.e., apex) or the blade of tongue is considered to be [+coronal]; any phoneme which is not articulated through the involvement of the tip or the blade of tongue is considered to be [-coronal].

Nasal

The top of the pharynx is like a crossroads. The airstream can exit the pharynx in either of two ways, depending on the position of the uvula.

If the uvula is lowered, a portion of the air will pass through the nasal cavity (the remainder finding its way through the oral cavity). If the uvula is raised, access to the nasal cavity is cut off, and the air can only pass through the oral cavity.

The sounds produced via the first method are [+nasal]. Those produced the other way are [-nasal].



Continuant

The phonetic feature [continuant] is used to describe the degree of obstruction involved in the articulation of a sound.

If the obstruction is partial, with enough space for the air to pass out through the mouth, the phoneme involved is [+continuant]. Otherwise, the phoneme will be [-continuant]. In English, all vowels, glides, liquids, and fricative consonants are [+continuant].

Only affricates, stops, and nasal are [-continuant]. The feature [+continuant] is a redundant feature for liquids and vowels. This is because the feature [+vocalic] means that the phoneme is automatically [+continuant].

Aspiration

In the articulation of word-initial voiceless stop consonants, in English, there is a build up of air pressure in the oral cavity prior to the actual release of airstream at the place of articulation.

Therefore, when these phonemes are produced, an increased puff of air accompanies the phonemes. This quality is called aspiration.

If you light a match, hold it in front of your mouth, and say a word like *Peter*, you may be able to feel the aspiration of the first sound.

Strident

This feature is in fact related to the manner of articulation of phonemes. As you will certainly remember, consonants are produced when a certain type of obstruction is introduced to the passage of air in the mouth.

Some consonants are explosive in the sense that the blocked air is suddenly released; some others are fricatives or affricates because the air moves out of the mouth through a narrow opening. In this latter case, sometimes there is a turbulence in the air (like in the case of /s/, /z/, /ʃ/, /ʒ/, /tʃ/, /dʒ/, /f/, and /v/), and sometimes there is no turbulence (like in the case of phonemes other than these).

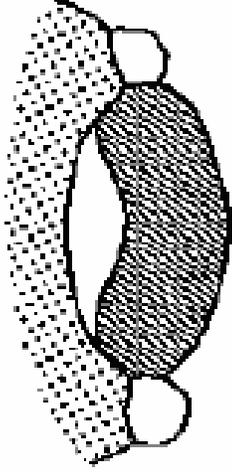
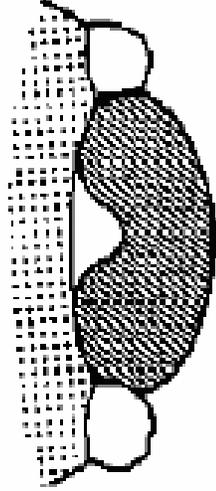
The feature [strident] simply says whether this turbulence exists or not. English liquids, glides, and vowels are [-strident].

[+Strident] sounds are categorized into two subtypes based on their place of articulation.

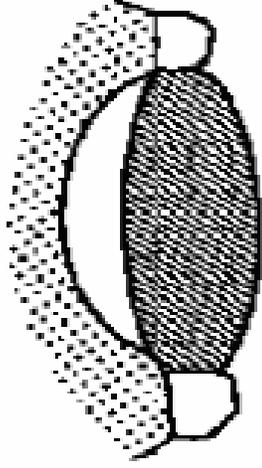
- /f/ and /v/ are [-sibilant].
- However, /s/, /z/, /ʃ/, /ʒ/, /tʃ/, and /dʒ/ are [+sibilant].

In fact, the term sibilant is used for hushers and hissers. During the articulation of [+sibilant] sounds, a groove is formed on the tongue so that the outgoing air takes on a hissing overtone. This hissing sound is not felt during the articulation of /f/ and /v/ (which are [+strident] labiodentals).

SIBILANT



NONSIBILANT



Lateral

To produce a lateral sound, air is obstructed by the tongue at a point along the centre of the mouth but the sides of the tongue are left low so that air can escape over its sides.

In fact, the tongue is strongly flexed and the air is forced through a narrow oval cavity, producing a hushing sound. /l/ is the clearest example of a [+lateral] sound in English.

Both the clear [l] and the word-final dark [ɫ] allophones (i.e., the variants of the same phoneme) of /l/ are [+lateral] sounds.

All other sounds of the English language are [-lateral]. Since /l/ is a liquid, we can safely claim that vowels, consonants, and glides are all [-lateral].

Sonorant

The nonnasal stops, the fricatives, and the affricates form a major class of sounds technically termed obstruents.

Nasals, on the other hand, form a class of sounds called sonorants. When the passage of air is blocked or constricted in the mouth, and the air passes out through the nose, the sound is [+sonorant].

When, by way of contrast, the air cannot escape through the nose, the sound is [-sonorant]. Fricatives are continuant obstruents because (a) the air is constricted in the mouth, and (b) the air cannot escape through the nose.

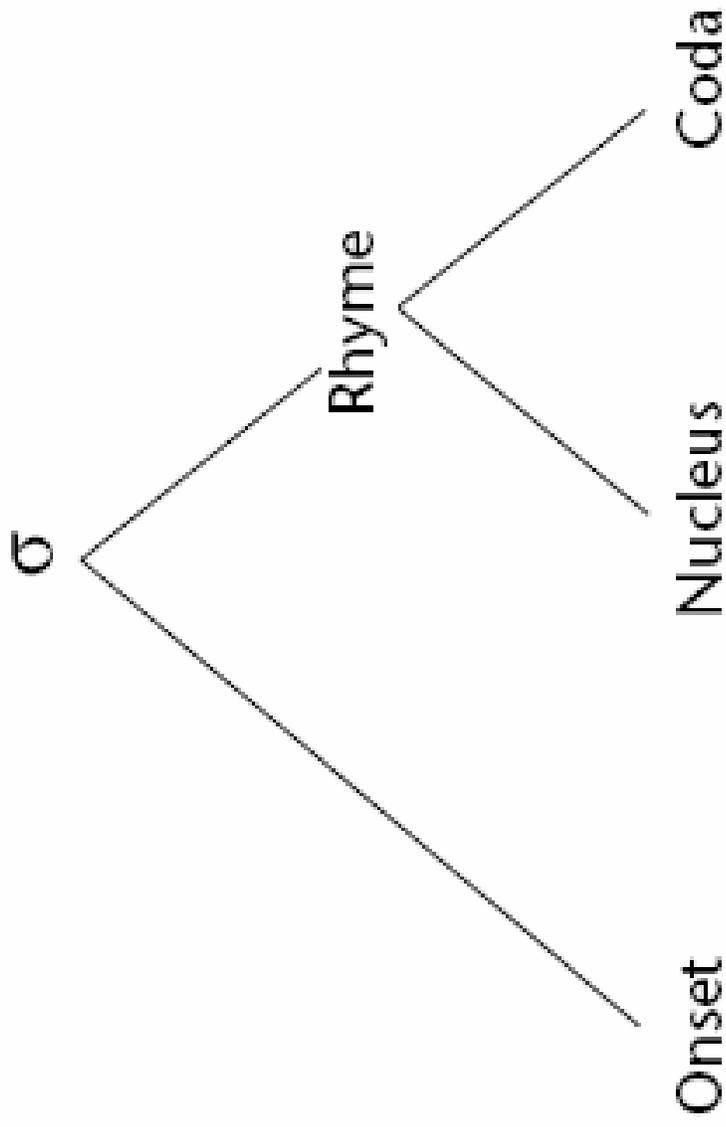
Nonnasal stops and affricates are noncontinuant obstruents because (a) the air is completely blocked in the mouth, and (b) it cannot escape through the nose. Obstruents are, therefore, [-sonorant].

Syllabic

Vowels usually constitute the "main core" or the nucleus of syllables; every vowel is at the center of a single syllable. Vowels can even occur as syllables.

For instance, the word ago /ə geʊ/ is composed of two syllables: /ə/ and /geʊ/. The first syllable is a single vowel.

Even in the second syllable, the vowel (or the diphthong) takes the prominence (or stress) on itself. Therefore, vowels are said to be [+syllabic].



Syllable structure

It was pointed out earlier that every language of the world contains the two basic classes of speech sounds often referred to by the cover terms consonants and vowels.

This classification implies that consonants and vowels differ. In the production of consonants the flow of air is obstructed as it travels through the mouth. Vowels are produced with no obstruction in the mouth whatsoever.

Oral and nasal stops, fricatives, affricates, liquids, and glides all have some degree of obstruction and are therefore consonants.

Consonants do not correspond exactly to the sounds specified as [+consonantal], because glides are [-consonantal], forming a subclass with vowels (which is why they often occur as part of a vocalic diphthong, and are also called semi-vowels).

However, unlike vowels, glides are produced with some small oral obstruction and therefore do not constitute syllable peaks (i.e., they can neither occur as syllables nor do they govern stress), as do vowels.

Vowels, like glides, are [-consonantal] and [+sonorant]. They differ from glides because they constitute syllable peaks; so vowels are [+syllabic], whereas glides are [-syllabic].

Syllabic	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	
Sonorant	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	
Lateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Strident	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	+	+	+	+
Coronal	-	-	+	+	-	-	-	+	-	+	+	-	-	+	+	+	+	+	+
Anterior	+	+	+	+	-	-	+	+	-	-	-	+	+	+	+	+	+	-	-
Aspirated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Continuant	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+
Abrupt release	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
Nasal	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
Voice	-	+	-	+	-	+	+	+	+	-	+	-	+	-	+	-	+	-	+
Consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Vocalic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PHONEME	/p/	/b/	/t/	/d/	/k/	/g/	/m/	/n/	/ŋ/	/tʃ/	/dʒ/	/f/	/v/	/θ/	/ð/	/s/	/z/	/ʃ/	/ʒ/
	PLOSIVES						NASALS			AFFRICATES		FRICATIVES							
	STOPS																		

Syllabic	+	+	.	.	.
Sonorant	+	+	+	+	+
Lateral	+	.	.	.	.
Strident	.	.	.	.	.
Coronal	.	.	.	.	.
Anterior	+	+	.	.	.
Aspiration	.	.	.	.	.
Continuant	+	+	+	+	+
Abrupt release	.	.	.	.	.
Nasal
Voice	+	+	.	+	+
Consonantal	+	+	.	.	.
Vocalic	+	+	.	.	.
PHONEME	/l/	/r/	/h/	/w/	/j/
	LIQUIDS		GLIDES		

Exercise

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