Features of consonants

Important classes of consonants

obstruents:
- plosives (oral stops) [p, b, ...]
- fricatives [f, v, ...]
- affricates [pf, tʃ, ...]

obstruent [G. Obstruent]: sounds that are produced with a build-up of air-pressure in the vocal tract. These include in particular the plosives, the fricatives, and the affricates.

Voicing of obstruents: Typically, either (a) or (b) is found:
(a) A language may have a voiceless obstruent, but no voiced counterpart of it.
(b) A language may have a voiceless obstruent and its voiced counterpart.

English:

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<thead>
<tr>
<th></th>
<th>plosives</th>
<th>fricatives</th>
<th>affricates</th>
</tr>
</thead>
<tbody>
<tr>
<td>voiceless</td>
<td>p</td>
<td>t</td>
<td>k</td>
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<tr>
<td>voiced</td>
<td>b</td>
<td>d</td>
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German:

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grey: sounds not found in the other language (between English and German)
boldfaced: allophones ([ç] and [x])

Being voiceless is unmarked for obstruents. Being voiced is marked for obstruents.

Articulation: vocal cords need airstream to vibrate; obstruents obstruct airstream so much that air-pressure is built up in the oral cavity. This obstruction makes voicing on obstruents more difficult -> it’s easier if the obstruent is voiceless.

Plosives: voicing until air-pressure is built up; if release follows immediately -> voicing is continuous; if release does not follow immediately -> voicing is interrupted even during a voiced sound.
Fricatives: continuous airflow allows continuous voicing; however, the narrow constriction and the air-pressure make voicing more difficult.

sonorants:
• nasals (nasal stops)  [m, n, ŋ]
• liquids  [l, r]
also sonorant are:
• glides  [j, w]  example: you [juː], woman [wʊmən]
• vowels  [a, e, ...]

**sonorant** [G. *Sonant, Sonorlaut*]: sound not produced with a build-up of air-pressure in the vocal tract.

**Voicing of sonorants**: Typically, sonorants are voiced.

**English phonemes**:

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**German phonemes**:

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However, there are voiceless allophones of the liquids and glides in both languages, following initial voiceless plosives. In a very detailed transcription, this is transcribed with a little circle below the voiceless sound:

- [plɪːz] please
- [trɪː] tree
- [kwɛstʃən] questions
- [plæn] Plan
- [tʁaŋ] tragen
- [klʊk] klug (final [k] is due to a general rule of Final devoicing in German)

**Voicing** is considered unmarked for sonorants.

**Acoustics and perception**: The sound of a sonorant comes about by the way the vibrations from the vocal cords resonate in the vocal tract. An important way of distinguishing the sonorants from each other is to listen to the sound characteristics of the result of this. If there is no voicing, there is nothing that can resonate in this way, and sonorants are difficult to hear and to distinguish.

**Features**:

**[+sonorant]**: sounds produced with no build-up of air-pressure in the vocal tract (sonorants).
**[-sonorant]**: sounds produced with build-up of air-pressure in the vocal tract (obstruents).

**[+voiced]**: sounds produced with vibration of the vocal cords.
**[-voiced]**: sound produced with the vocal cords held apart.
**Nasal harmony**

**Source:**

Nasal harmony is a process by which nasal consonants and sometimes nasal vowels lead to nasalization of neighboring segments. It usually applies iteratively, i.e. the rule reapplyes to its own output. It does so until it reaches the end of the word, or is blocked by the presence of some segment. Languages can differ as to whether they have such a rule, they differ as to which nasal segments can trigger it, and which segments can block it.

**Transcription:** Nasalization is transcribed by a tilde [~] on top of a nasal sound (unless the sound is a nasal consonant like [m, n, ŋ], in which case this is not separately transcribed).

**Group 1: Malay (Johore dialect)**

All vowels and glides are underlyingly non-nasal. Nasal harmony is triggered by nasal consonants (they are thus the 'triggers').
1. Does it go from a nasal consonant leftward or rightward or both? What examples show this?
2. What examples show that it applies iteratively?
3. What are the classes of sounds that undergo the process of nasalization (=nasal harmony) (i.e. what are the 'targets')?
4. What are the classes of sounds that block nasal harmony, i.e. that do not undergo it and prevent it from going across them?

(1) a. banjôn 'to rise'
   b. mājāŋ 'stalk (palm)'
   c. mōnāwān 'to capture (active)'
   d. mōratappi 'to cause to cry'
   e. pōjāwāsan 'supervision'
   f. pōmāndaŋān 'scenery'
   g. mākan 'to eat'

Using the feature [+nasal] for nasal consonants and nasal vowels, can you write a rule for this process of nasal harmony? (The fact that it applies iteratively cannot be written into the rule, and must be stated separately; so the rule just needs to nasalize one sound, in the right direction.)

Apart from [+nasal], what kind of feature would be helpful for writing such a rule?
Group 2: Ijo (one of many languages spoken in Nigeria, here the Kokokuma dialect)

In Ijo, some vowels are underlyingly nasal, others are underlyingly non-nasal. Nasality spreads from nasal consonants and from nasal vowels. When /l/ is nasalized, it turns into [n]. The forms below include abstract postulated underlying representations, that you should work with.

1. Does the process go from a nasal consonant & vowel leftward or rightward or both? What example(s) show(s) this?
2. What examples show that it applies iteratively?
3. What are the classes of sounds that undergo the process of nasalization (=nasal harmony) (i.e. what are the 'targets')?
4. What are the classes of sounds that block nasal harmony, i.e. that do not undergo it and prevent it from going across them?

([r] is a liquid.)

(2) a. /umba/ [ûmba] 'breath'
b. /wâi/ [wâi] 'prepare sugarcane'
c. /jařï/ [jâřï] 'shake'
d. /sɔrɔ/ [sârɔ] 'five'
e. /sanlo/ [sânlo] 'gills'
f. /izoŋgo/ [izõŋgo] 'jug'
g. /abamu/ [abâmu] 'loft'
h. /otoŋgolo/ [otoŋgolo] 'mosquito'
i. /tɔl tî/ [tɔn tî] 'light (a lamp)'

Using the feature [+nasal] for nasal consonants and nasal vowels, can you write a rule for this process of nasal harmony? (The fact that it applies iteratively cannot be written into the rule, and must be stated separately; so the rule just needs to nasalize one sound, in the right direction.)
Spanish spirantization

[b, d, g] occur initially and after nasals, [β, δ, χ] occur after vowels, glides, liquids, fricatives; exception: [d] occurs after [l].

(Natural class of {vowels, glides, liquids, fricatives}:
articulation: continuous airflow through the mouth;
feature: continuant:

[+cont(inant)] sounds are produced with uninterrupted airflow in the oral cavity.
[-cont(inant)] sounds are produced with an interruption of the airflow in the oral cavity.)
### Arabic sun and moon letters

(4) a. ?al-qamr 'the moon'  
?al-faras 'the mare'  
?al-kitaab 'the book'  
?al-ḥarb 'the war'  
?al-ʔab 'the father'

b. ?aj-fams 'the sun'  
?ad-daar 'the house'  
?az-zajt 'the oil'  
?an-nahr 'the river'  
?ʔaʔ-ʔawb 'the garment'

*total assimilation*

(5) [l] → Cα/___ + Cα

What additional condition limits this to the cases in b.?

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**assimilation** [G. *Assimilation*]: a phonetic or phonological process by which a sound becomes more similar to, or takes on one or more properties of, another sound in its environment.