

Occlusives en anglais et français (et dans d'autres langues) : voisement et aspiration

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L'API : rappel

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC) © 2005 IPA

	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b		t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m ɱ		n ɳ		ɳ̠	ɲ	ŋ	ɴ		
Trill	ʙ		ʀ					ʀ̥		
Tap or Flap		ⱱ	ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative			ɬ ɮ							
Approximant		ʋ	ɹ		ɻ	j	ɰ			
Lateral approximant			l		ɭ	ʎ	ʟ			

Where symbols appear in pairs, (the one to the right) represents a voiced consonant. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

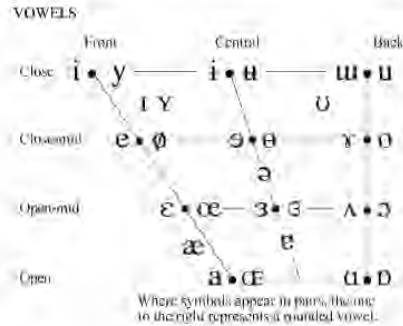
Clicks	Voiced implosives	Ejectives
ʘ Bilabial	ɓ Bilabial	ʼ Ejectives
ǀ Dental	ɗ Dental/alveolar	ɰ Dental
ǃ Postalveolar	ɟ Palatal	ɰ̣ Dental/alveolar
ǂ Palatoalveolar	ɠ Velar	ɰ̤ Velar
ǁ Alveolar lateral	ʄ Uvular	ɰ̥ Alveolar fricative

OTHER SYMBOLS:

ʍ Voiceless labial-velar fricative	ɕ ʑ Alveolo-palatal fricatives
ʋ Voiced labial-velar approximant	ɺ Voiced alveolar lateral flap
ɥ Voiced labial-palatal approximant	ɥ Simultaneous ʃ and ɰ
ɦ Voiceless epiglottal fricative	ʎ Diphthongs and diphthong articulations can be represented by two symbols joined by a vowel line if necessary.
ʕ Voiced epiglottal fricative	
ʡ Epiglottal plosive	

DIACRITICS. Diacritics may be placed above a symbol with a descender, e.g. ɲ̥̄

◌̥ Voiceless	◌̄ Breathily-voiced	◌̆ Dental	◌̇ Alveolar
◌̇ Voiced	◌̆ Creakily-voiced	◌̆ Apical	◌̇ Laminal
◌̆ Aspirated	◌̆ Linguolabial	◌̆ Nasalized	◌̇
◌̆ More rounded	◌̆ Labialized	◌̆ Nasal release	◌̆
◌̆ Less rounded	◌̆ Palatalized	◌̆ Lateral release	◌̆
◌̆ Advanced	◌̆ Voiced	◌̆ No audible release	◌̆
◌̆ Retracted	◌̆ Pharyngealized		
◌̆ Centralized	◌̆ Velarized or pharyngealized		
◌̆ Mid-centralized	◌̆ Raised	◌̆ = voiced alveolar fricative	
◌̆ Syllabic	◌̆ Lowered	◌̆ = voiced bilabial approximant	
◌̆ Non-syllabic	◌̆ Advanced Tongue Root		
◌̆ Rhoticity	◌̆ Retracted Tongue Root		



L'API ?

L'Alphabet Phonétique Internationale

L'Association Phonétique Internationale

Le principe de base ?

1 son = 1 symbole

Pourquoi l'API ?

- Outil indispensable de description phonétique/phonologique des langues du monde.

API : outils interactifs

- Illustration sonore de l'API :

<http://web.uvic.ca/ling/resources/ipa/charts/IPALab/IPALab.htm>

- Appli iPad / iPhone gratuite « iPA Phonetics » :

<https://itunes.apple.com/us/app/ipa-phonetics/id869642260?mt=8>

Consonnes : 3 critères de classification

CONSONANTS (PULMONIC)

© 2005 IPA

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

- Voisement
(sourde/sonore)

- Lieu

- Mode

-> ex. « fricative labio-dentale sonore »

- Voice
(voiceless/voiced)

- Place

- Manner

-> ex. “voiced labio-dental fricative”

Les occlusives

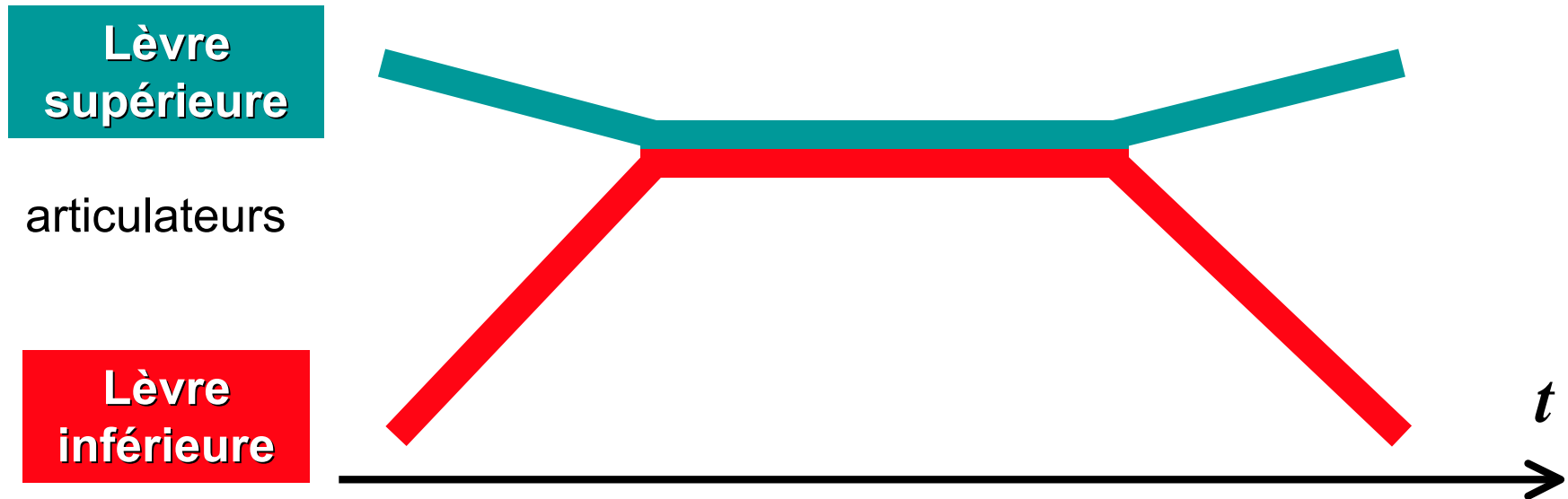
Les occlusives / plosives (stops)

Consonnes (pulmonaires) CONSONANTS (PULMONIC)

		Bilabial	Labiodental	Dental	Alveolar	Post
Occlusive (orale)	Plosive(stop)	p b			t d	
(Occlusive) Nasale	Nasal	m	ɱ		n	
Vibrante	Trill	ʙ			r	
Battue	Tap or Flap			ɾ	ɽ	
Fricative	Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ
Fricative latérale	Lateral fricative				ɬ ɮ	
Approximante	Approximant			ʋ	ɹ	
Approximante latérale	Lateral approximant				l	

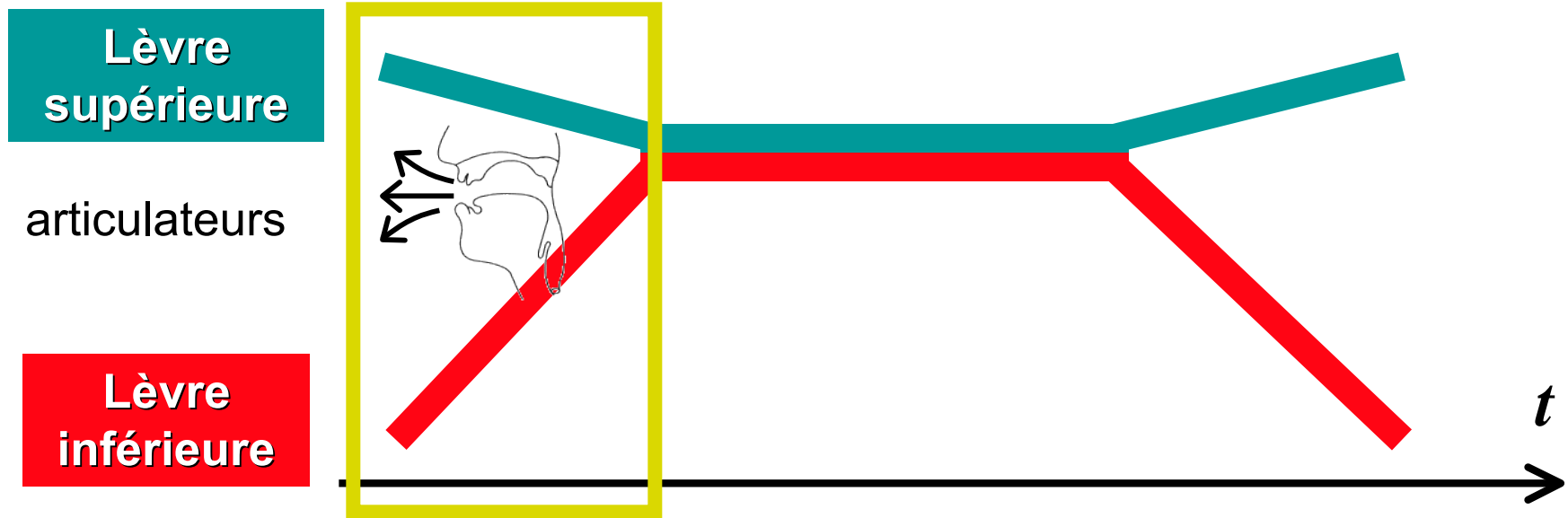
Where symbols appear in pairs, the one to the right represents

Les occlusives / plosives (*stops*) : le cas des occlusives bilabiales



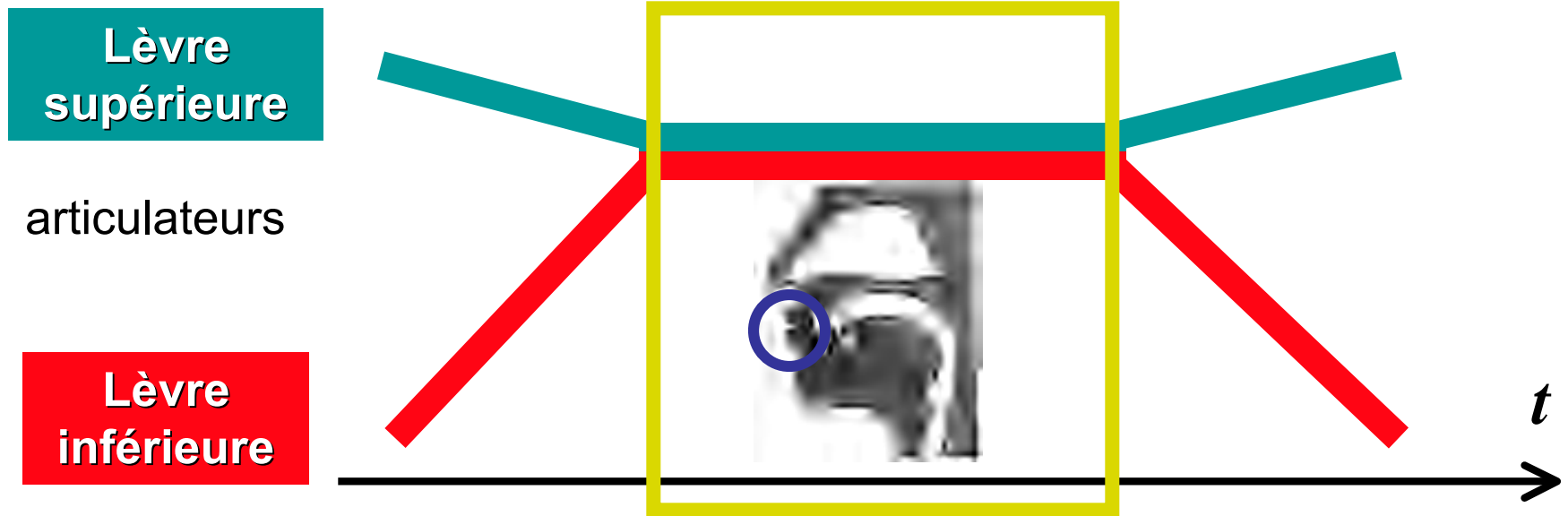
- 4 phases

Les occlusives / plosives (*stops*) : le cas des occlusives bilabiales



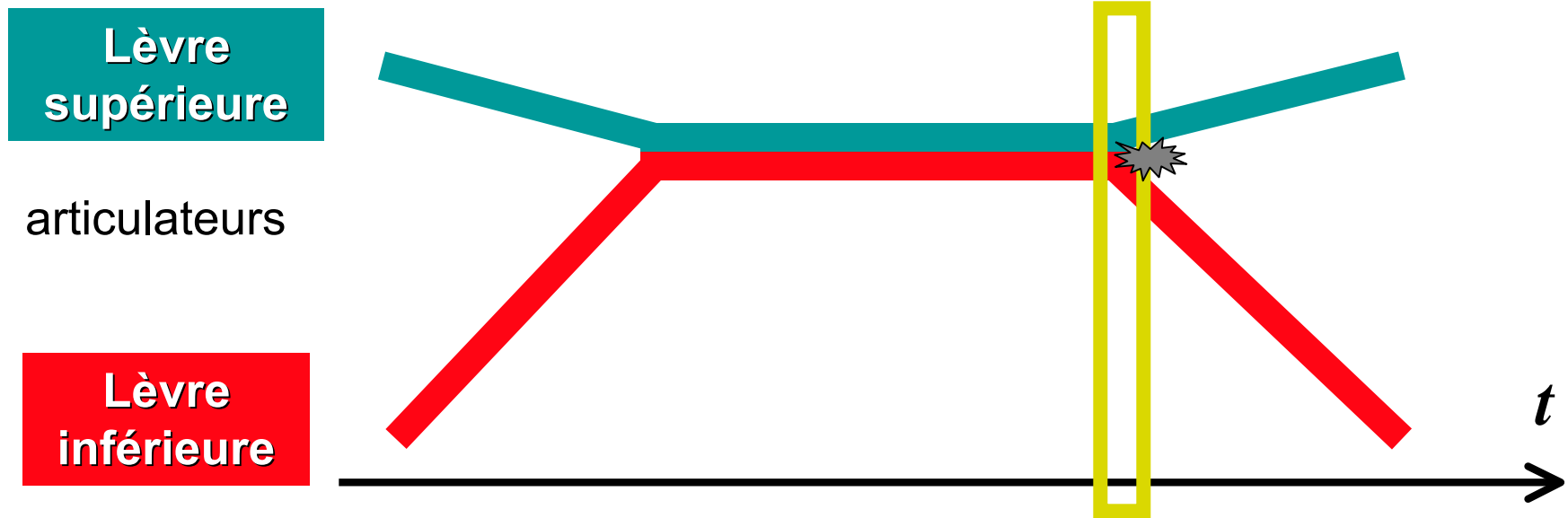
- **1. Phase d'approche:** l'un des articulateurs s'approche de l'autre, ou deux articulateurs s'approchent, afin de former une constriction qui ne permet à aucun flux d'air de s'échapper du conduit vocal.

Les occlusives / plosives (*stops*) : le cas des occlusives bilabiales



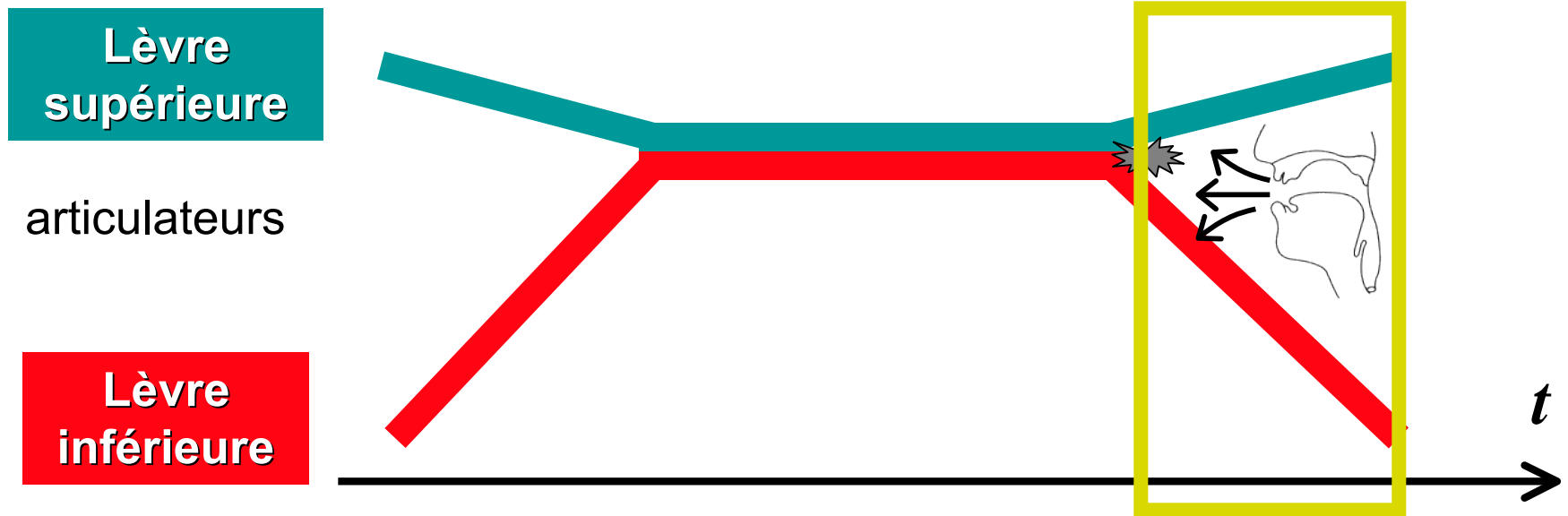
- **2. Phase de tenue d'occlusion:** une constriction complète est formée. Aucun air ne s'échappe du conduit vocal. L'air est comprimé derrière la constriction, et la pression d'air augmente.

Les occlusives / plosives (*stops*) : le cas des occlusives bilabiales



- **3. Phase de relâchement** : quand les articulateurs (les lèvres supérieure et inférieure) s'écartent, le flux d'air est libéré, ce qui crée une petite rafale (appelée plosion).

Les occlusives / plosives (*stops*) : le cas des occlusives bilabiales



- **4. Phase post-relâchement** : les articulateurs (les lèvres supérieure et inférieure) s'écartent davantage.

Les occlusives / plosives (*stops*) : le cas des occlusives bilabiales

- Phases 1-3

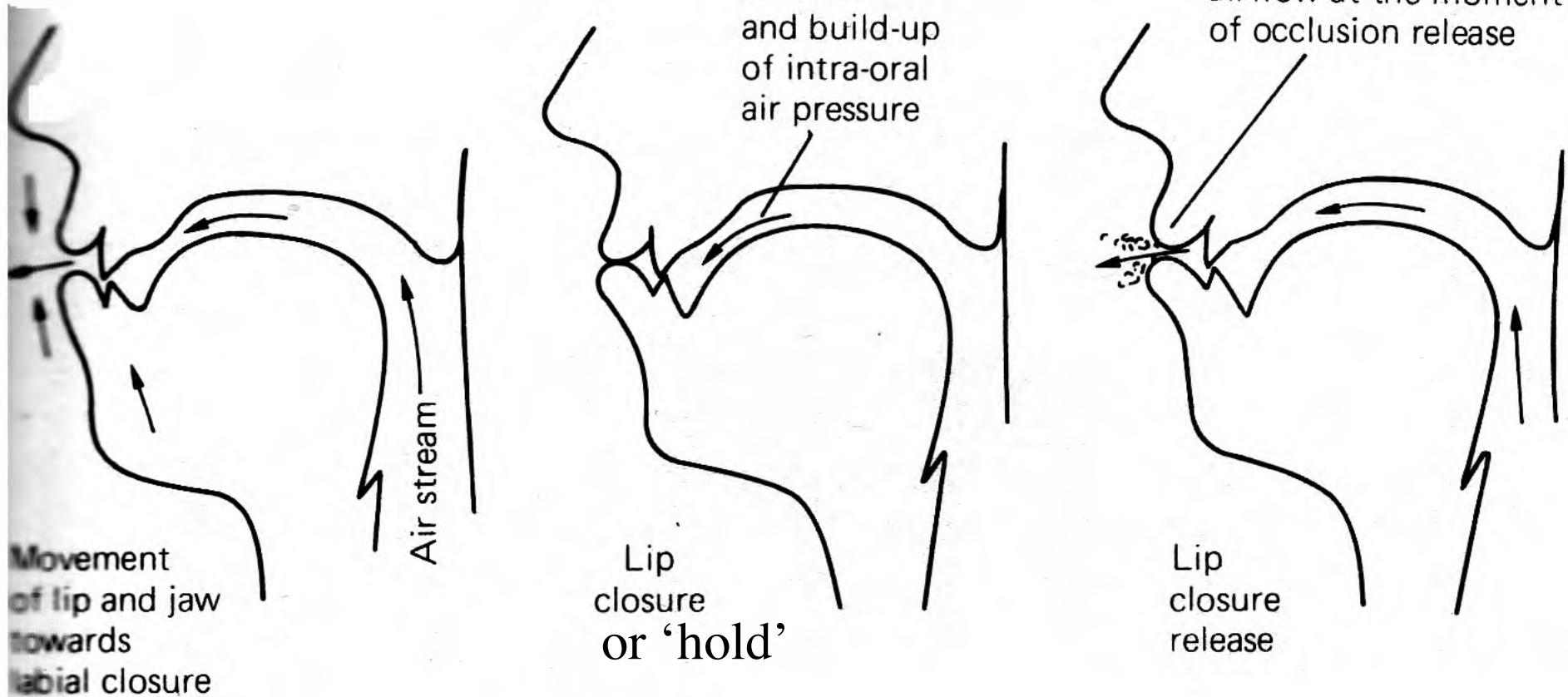


FIGURE 2.12.1 Phases of a bilabial plosive

Clark & Yallop (1995)

Aspiration et voisement (<->
dévoisement)

Aspiration et voisement

DIACRITICS Diacritics may be placed above a symbol with a descender, e.g. $\overset{\circ}{j}$

$\overset{\circ}{}$	Voiceless	$\overset{\circ}{n}$ $\overset{\circ}{d}$	$\overset{\cdot\cdot}{}$	Breathy voiced	$\overset{\cdot\cdot}{b}$ $\overset{\cdot\cdot}{a}$	$\overset{\square}{}$	Dental
$\underset{\vee}{}$	Voiced	$\underset{\vee}{s}$ $\underset{\vee}{t}$	$\underset{\sim}{}$	Creaky voiced	$\underset{\sim}{b}$ $\underset{\sim}{a}$	$\underset{\square}{}$	Apical
$\overset{h}{}$	Aspirated	t^h d^h	$\underset{\sim}{}$	Linguolabial	$\underset{\sim}{t}$ $\underset{\sim}{d}$	$\overset{\square}{}$	Laminal
$\overset{\circ}{}$	More rounded	$\overset{\circ}{\text{ɔ}}$	$\overset{w}{}$	Labialized	t^w d^w	$\underset{\sim}{}$	Nasalized
$\underset{c}{}$	Less rounded	$\underset{c}{\text{ɔ}}$	$\overset{j}{}$	Palatalized	t^j d^j	$\overset{n}{}$	Nasal release
$\overset{+}{}$	Advanced	$\overset{+}{u}$	$\overset{y}{}$	Velarized	t^y d^y	$\overset{l}{}$	Lateral release
$\overset{-}{}$	Retracted	$\overset{-}{e}$	$\overset{\text{ɤ}}{}$	Pharyngealized	$t^{\text{ɤ}}$ $d^{\text{ɤ}}$	$\overset{\text{ɹ}}{}$	No audible release
$\overset{\cdot\cdot}{}$	Centralized	$\overset{\cdot\cdot}{e}$	$\underset{\sim}{}$	Velarized or pharyngealized	ɫ		
\times	Mid-centralized	$\times e$	$\underset{\perp}{}$	Raised	$\underset{\perp}{e}$ ($\underset{\perp}{j}$ = voiced alveolar fricative)		
$\underset{\cdot}{}$	Syllabic	$\underset{\cdot}{n}$	$\underset{\text{ɹ}}{}$	Lowered	$\underset{\text{ɹ}}{e}$ ($\underset{\text{ɹ}}{\beta}$ = voiced bilabial fricative)		

Voiced and voiceless plosives: Word-initial position

- Observe the consonant at the **beginning** of the following words:
 - /**p**æk/
 - /**b**æk/
- Then compare them with the consonant at the beginning of the following words in French:
 - /**p**ak/ (« Pâque »)
 - /**b**ak/ (« bac »)

Voiced and voiceless plosives: Word-initial position

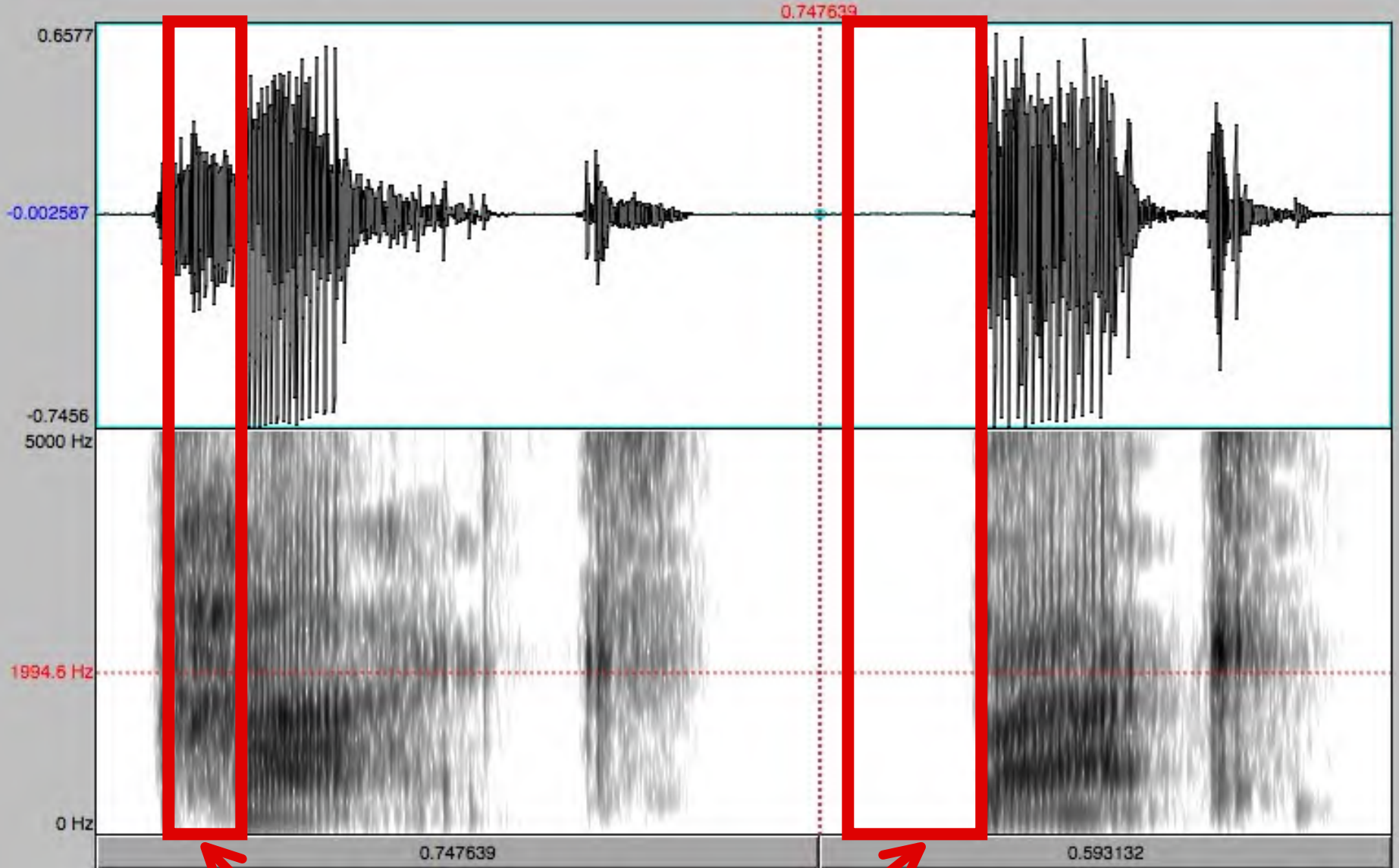
- Demonstration:
- /**p**æk/
- /**b**æk/

(in French)

- /**p**ak/ (« Pâque »)
- /**b**ak/ (« bac »)

/pæk/

/bæk/

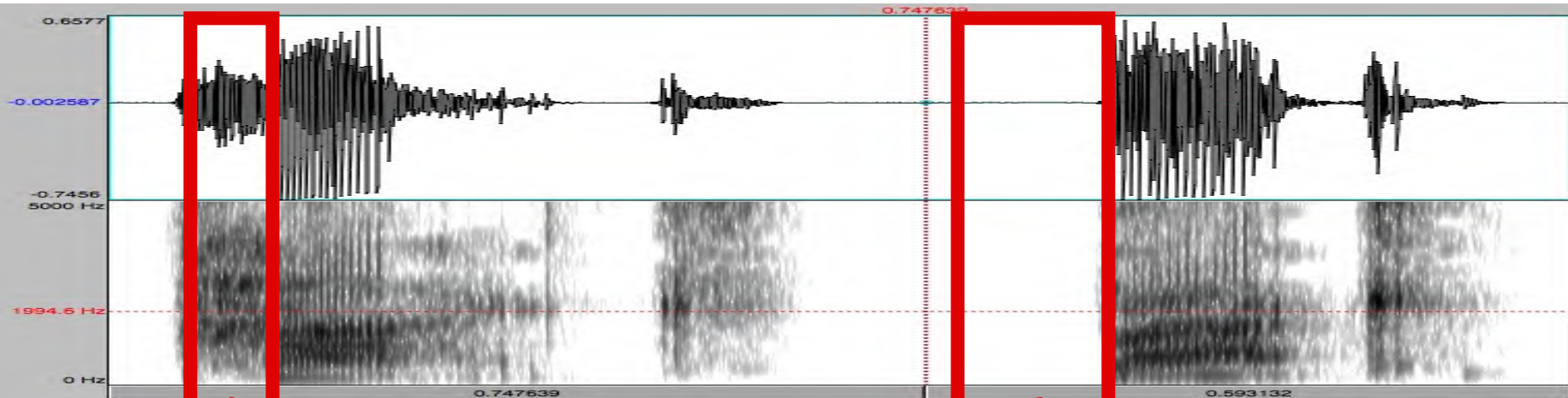


aspiration

devoicing (absence of voicing)

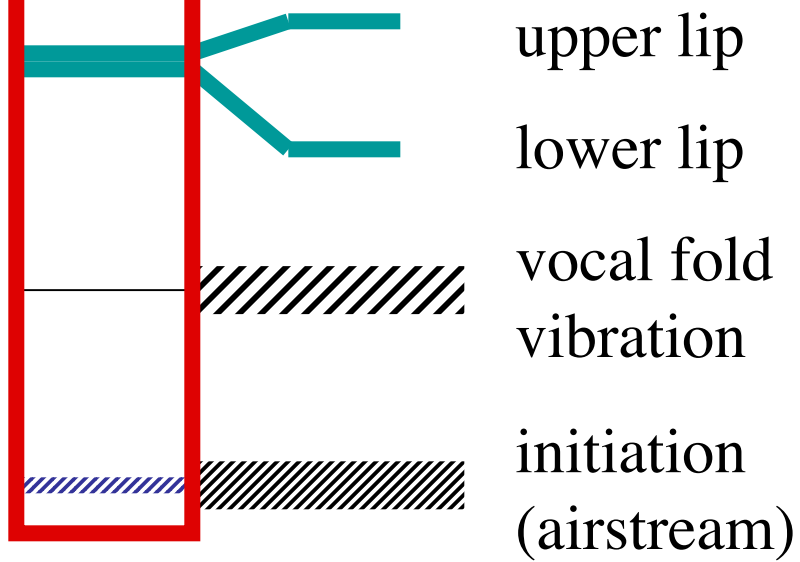
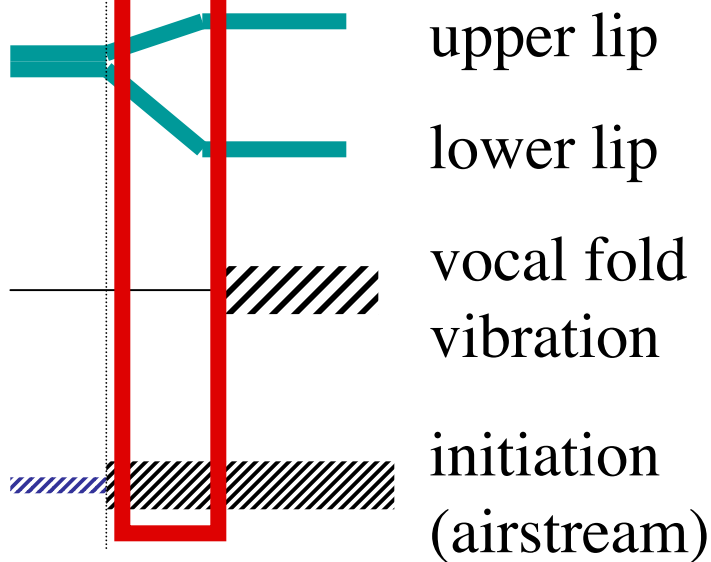
/pæk/

/bæk/



aspiration

devoicing (absence of voicing)



Voiced and voiceless plosives: Word-initial position

Aspiration

- /pæk/ : phonemic transcription
- [p^hæk] : narrow (detailed) transcription

Devoicing: (partial) absence of voicing

- /bæk/
- [b̥æk]

Dévoisement (amuïssement) / *devoicing*

- N.B. Il s'agit de « dé » (< *dē* latin : séparation, éloignement) + « voisement ».
- Consonne sonore -> sourde
-> les **consonnes sourdes ne peuvent pas être « dévoisées »** (amuïes), parce qu'elles sont *déjà* sourdes, sans voisement, par définition ou par défaut.

Ex. ok[**b**æk] ???[**p**æk]

Voisement et aspiration

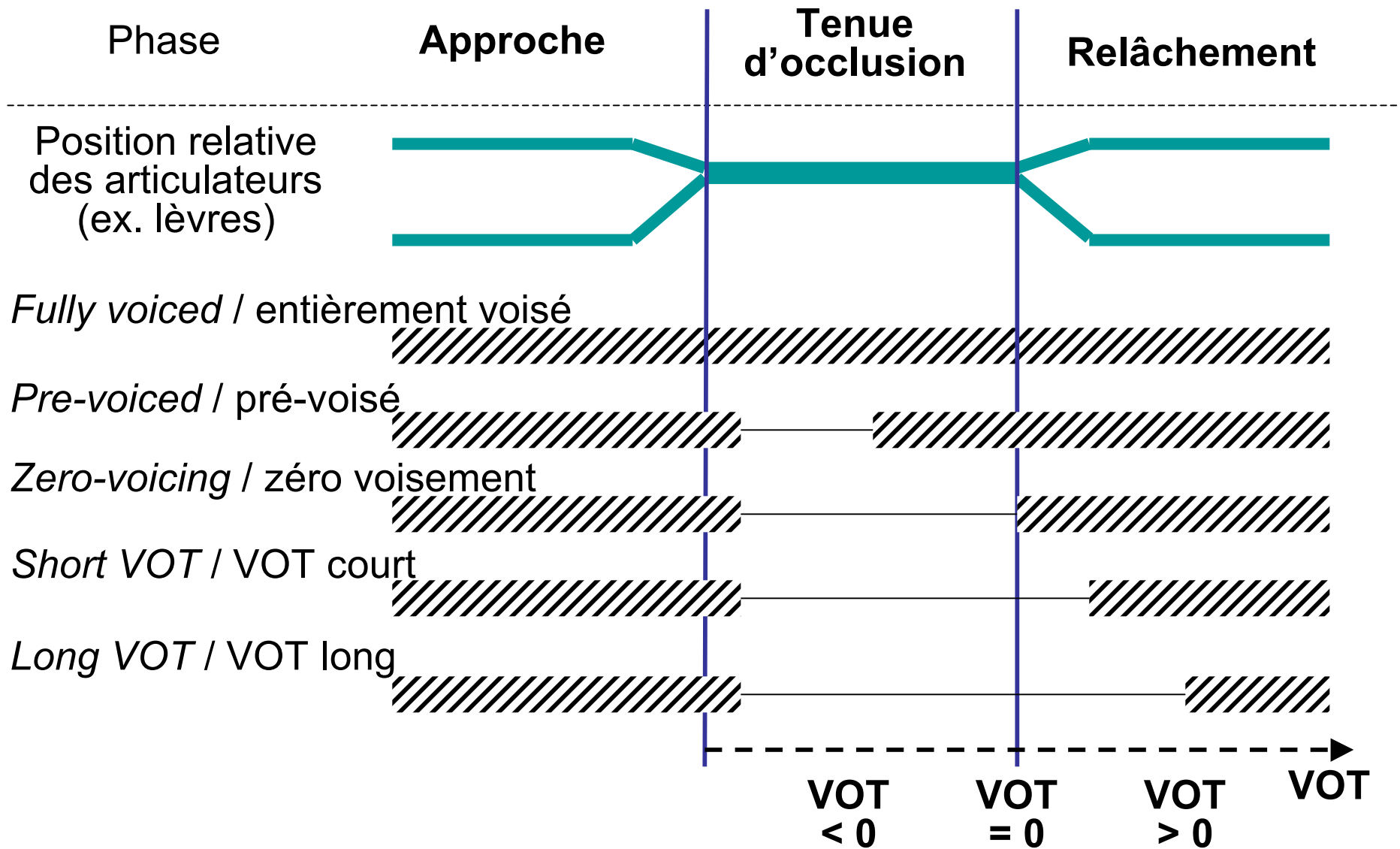
- VOT : *Voice Onset Time* (délai d'établissement du voisement)
- Lisker, Leigh & Abramson, Arthur S. (1964) A Cross-Language Study of Voicing in Initial Stops: Acoustical Measurements. *Word* 20(3), 384-422.

Voisement et aspiration

- VOT : *Voice Onset Time* (délai d'établissement du voisement)
- Lisker, Leigh & Abramson, Arthur S. (1964) A Cross-Language Study of Voicing in Initial Stops: Acoustical Measurements. *Word* 20(3), 384-422.
- Figure 1. Wide-band spectrograms showing three conditions of voice onset time: voicing lead, short voicing lag, and long voicing lag. (Example from Thai.)




Voisement et aspiration



- Figure adaptée de Ashby & Maidment (2005: 95)

Voisement et aspiration

- Cantonais


 [pã] ‘*father*’

 [p^hã] ‘*to lie prone*’

- Thaï

 [bā:n] ‘*to bloom*’

 [pā:n] ‘*birthmark*’

 [p^hā:n] ‘*belligerent*’

- Coréen

 /pal/ [pal] « fortis » (glottalisé) ‘*sucking*’


 /bal/ [ɸal / pal] « lenis » ‘*foot*’


 /p^hal/ ‘*arm*’ « aspirée »


Voisement et aspiration


- Aspirée voisée ?

- Hindi

 [paɪ] 'nurture'

 [pʰaɪ] 'knife blade'

 [baɪ] 'hair'

 [bʰaɪ] 'brow'

- Nepali (UCLA)

<http://archive.phonetics.ucla.edu/Language/NEP/nep.html>

[paɪ] 'rear'

[pʰaɪ] 'throw away'

[baɪ] 'burn! light!'

[bʰaɪ] 'forehead'

Observation [bʰ]: prévoisement + aspiration, ou prévoisement + voix soufflé (*breathy voice*), selon le locuteur

Mots d'emprunt des deux langues en coréen

- Voisées /b d g/ -> lenis /p t k/
- Non-voisées /p t k/ -> fortis /p' t' k'/ ou aspirées /p^h t^h k^h/
- Mais neutralisation de voisement **en début de mot en japonais**

En japonais ?

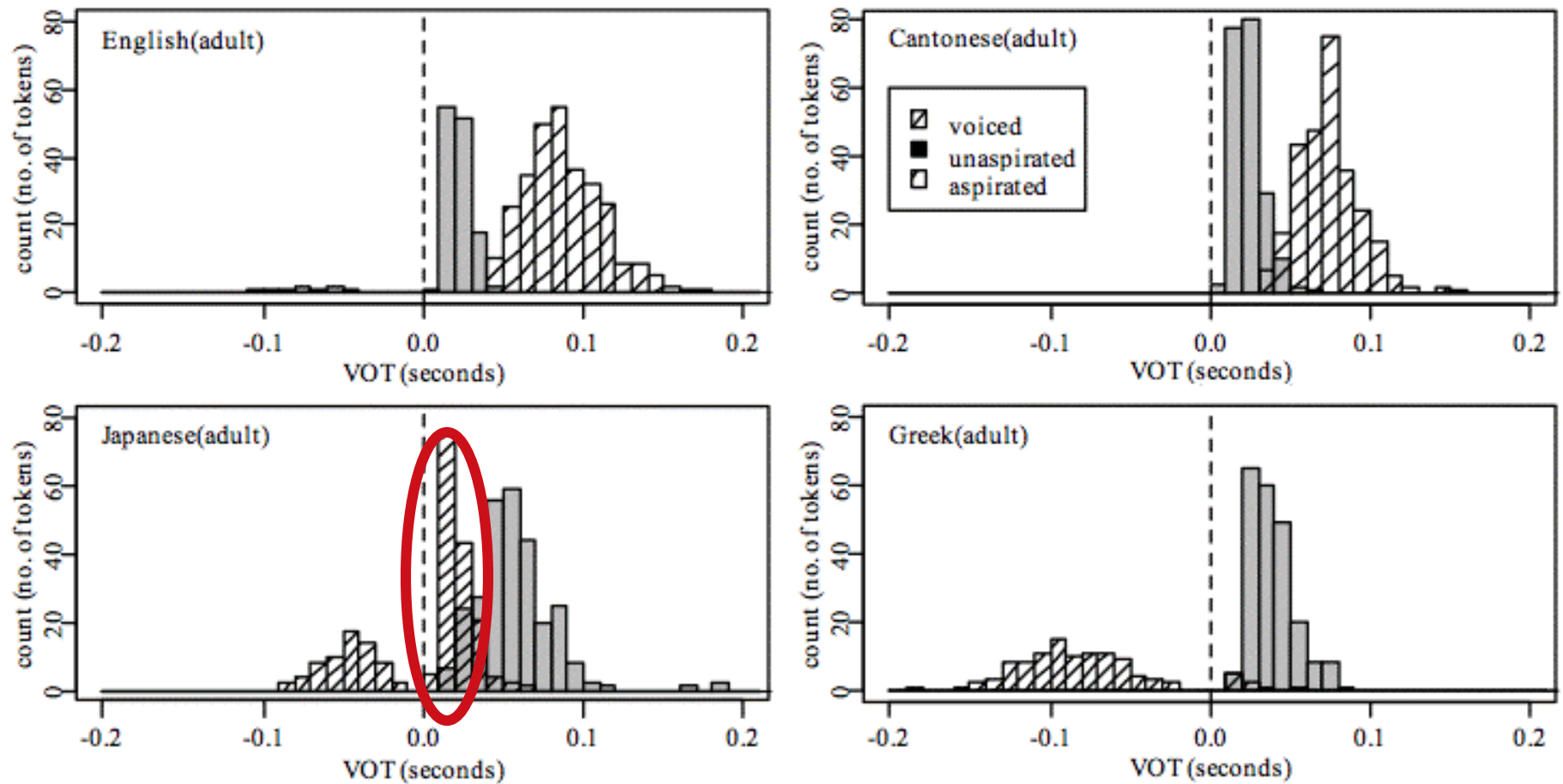


Figure 1. VOT values for velar stops (adults).

Kong et Beckman 2006



Research Article

Plosive (de-)voicing and /ʀ/ perturbations in Tokyo Japanese: Positional variation, cue enhancement, and contrast recovery



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Cue enhancement

ABSTRACT

This study addresses the two-way laryngeal contrast of plosives in Tokyo Japanese, which is commonly analyzed as a “true voicing” language. We examine how voicing-related properties of the plosive and /ʀ/ of the following vowel varied with the position in the word and in the sentence. We compare word-initial with word-medial positions for words in citation (between two pauses) and for two prosodic conditions in a carrier sentence, with vs. without a preceding pause. In word-initial position, unlike in a typical “true-voicing” language such as French, voiced plosives in Tokyo Japanese show a high devoicing rate, while voiceless plosives are moderately aspirated. A combination of VOT and /ʀ/ of the following vowel is used to distinguish the two plosive series. In word-medial position, voiced plosives are frequently prevoiced and voiceless plosives are unaspirated, while /ʀ/ does not differ after the two plosive series. This positional variation suggests that the onset-induced /ʀ/ effect is enhanced in word-initial position, where the VOT cue is not sufficient, but not in word-medial position, where the plosive voicing contrast is robustly marked by presence vs. absence of phonetic voicing. The differential use of cues in different environments in Tokyo Japanese provides another piece of evidence for the complexity of phonetic implementations of the voicing contrast. Finally, we discuss the enhancement of /ʀ/ perturbations as a source of a potential tonal development and ask whether such a development would take place in Tokyo Japanese.

Gao & Arai 2019

- This study addresses the two-way laryngeal contrast of plosives in Tokyo Japanese, which is commonly analyzed as a “true voicing” language. We examine how voicing-related properties of the plosive and f_0 of the following vowel varied with the position in the word and in the sentence. We compare word-initial with word-medial positions for words in citation (between two pauses) and for two prosodic conditions in a carrier sentence: with vs. without a preceding pause. In word-initial position, unlike in a typical “true-voicing” language such as French, voiced plosives in Tokyo Japanese show a high devoicing rate, while voiceless plosives are moderately aspirated. A combination of VOT and f_0 of the following vowel is used to distinguish the two plosive series. In word-medial position, voiced plosives are frequently prevoiced and voiceless plosives are unaspirated, while f_0 does not differ after the two plosive series. This positional variation suggests that the onset-induced f_0 effect is enhanced in word-initial position, where the VOT cue is not sufficient, but not in word-medial position, where the plosive voicing contrast is robustly marked by presence vs. absence of phonetic voicing. The differential use of cues in different environments in Tokyo Japanese provides another piece of evidence for the complexity of phonetic implementations of the voicing contrast. Finally, we discuss the enhancement of f_0 perturbations as a source of a potential tonal development and ask whether such a development would take place in Tokyo Japanese.

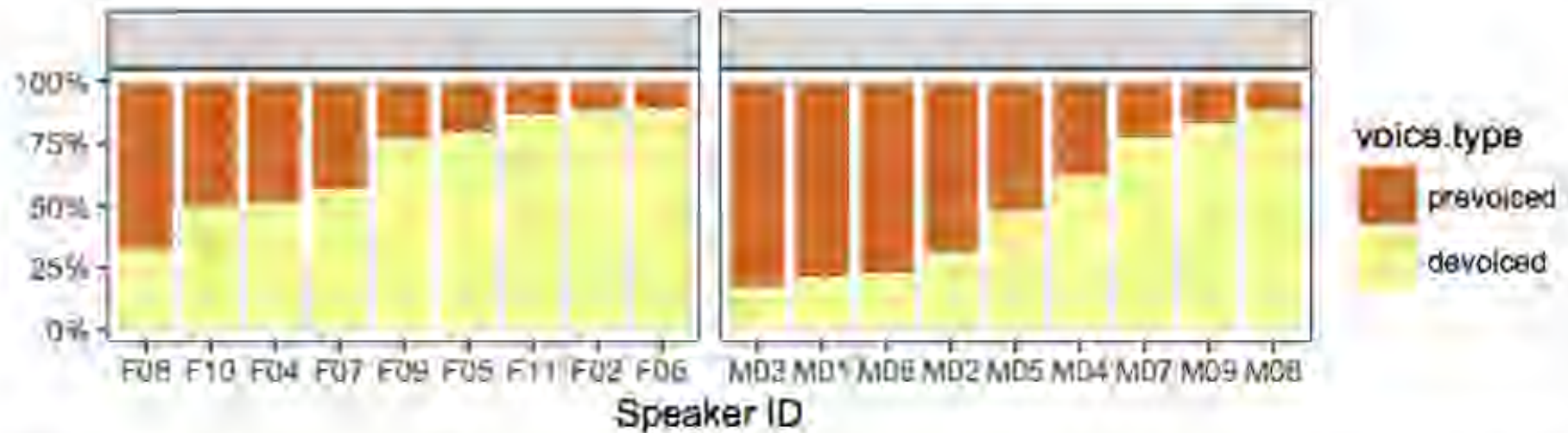


Fig. 1. Percentage of prevoiced vs. devoiced plosives in WI_citation by speaker: left panel for females, and right panel for males.

Females

Males

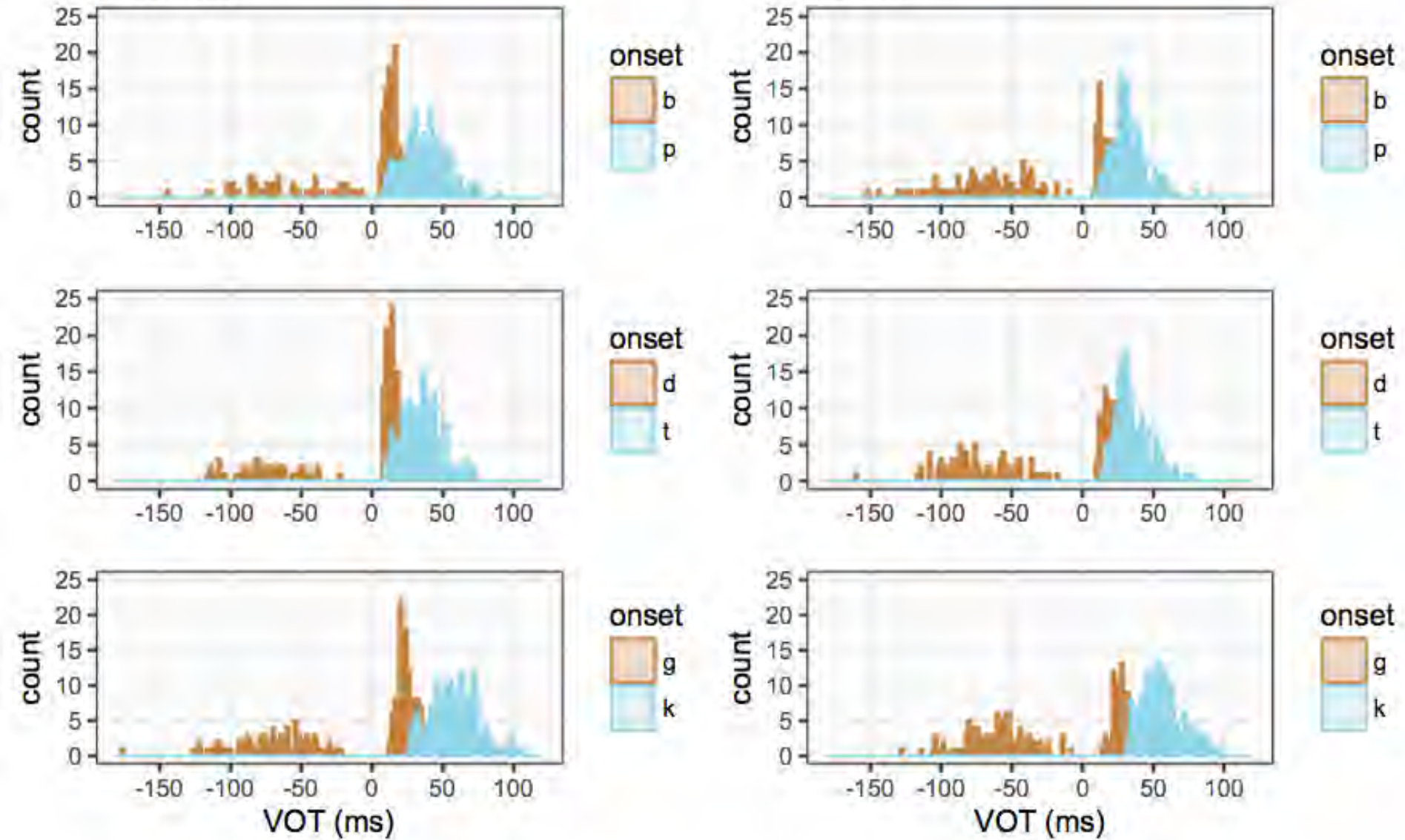
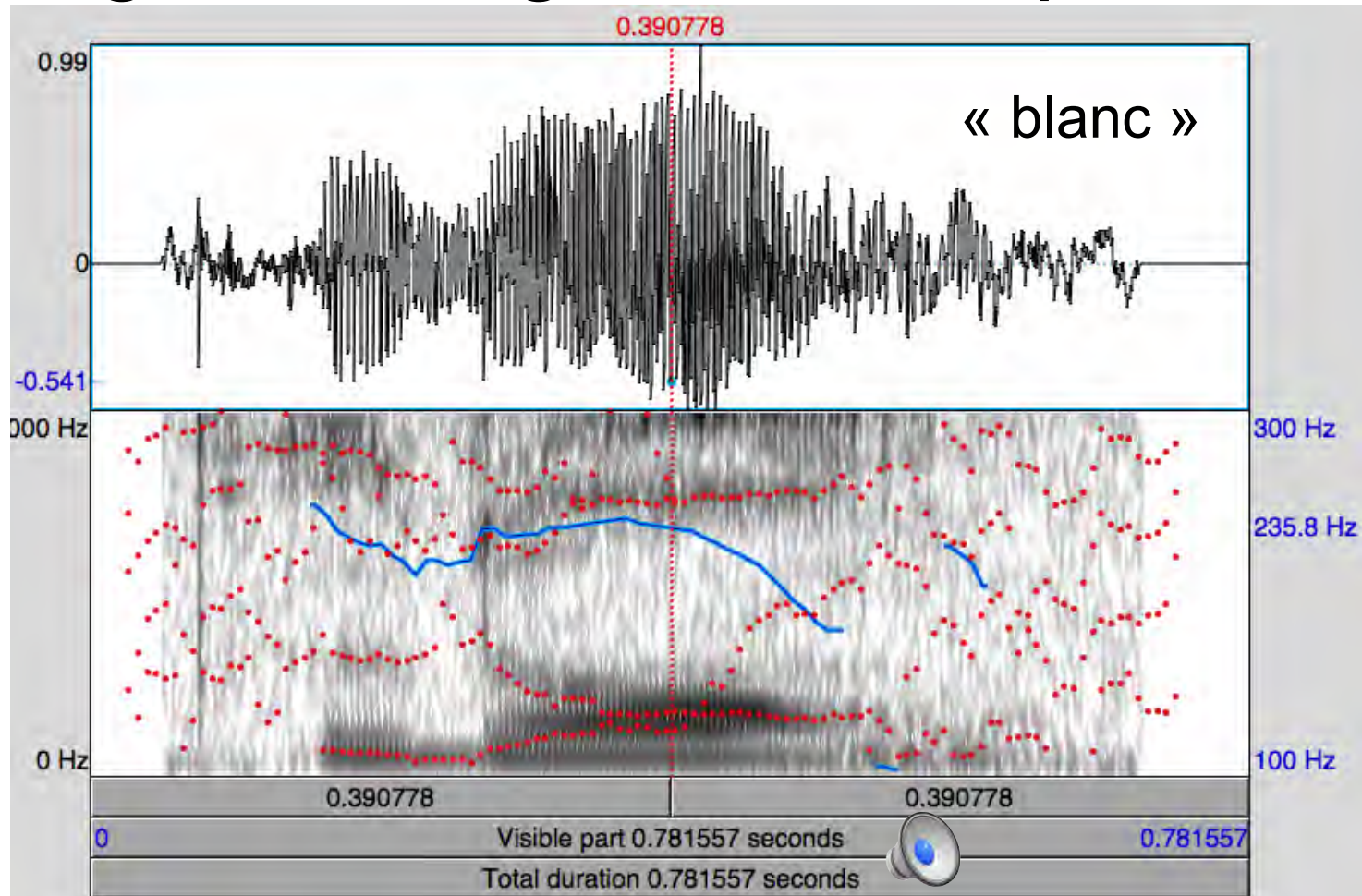


Fig. 3. VOT distribution of the two plosive series by place of articulation in WI_citation.

Japonophones apprenant le français langue étrangère : exemple IPFC





- Detey, Eychenne, Kawaguchi & Racine (éds.) (2016)
CD 24-33

Relâchement non audible

Diacritics may be placed above a symbol with a descender, e.g. $\overset{\circ}{\underset{\cdot}{j}}$

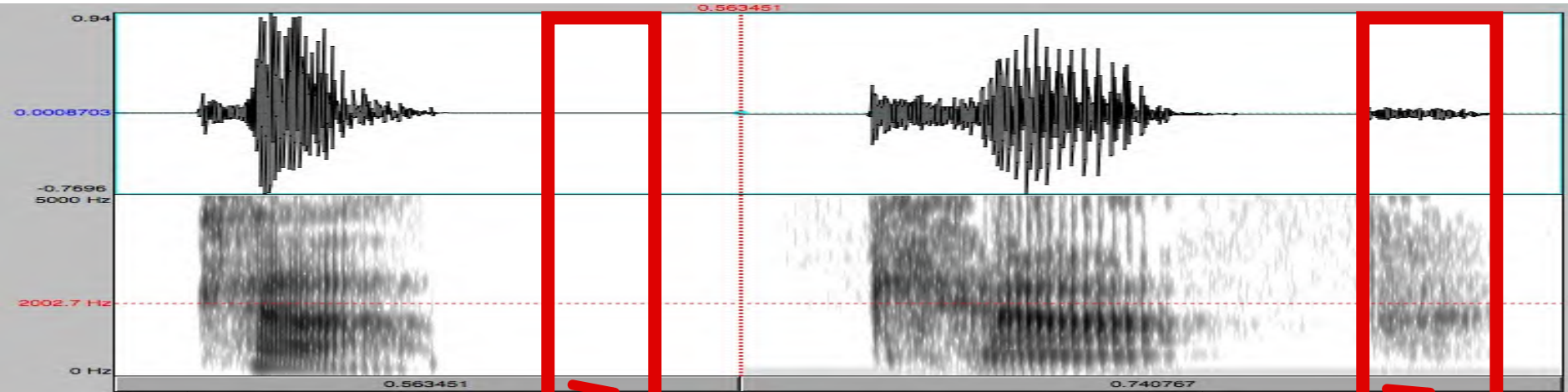
$\underset{\circ}{n}$ $\underset{\circ}{d}$.. Breathy voiced	$\underset{\cdot}{b}$ $\underset{\cdot}{a}$	$\underset{\cdot}{\square}$ Dental	$\underset{\cdot}{t}$ $\underset{\cdot}{d}$
$\underset{\sim}{s}$ $\underset{\sim}{t}$	~ Creaky voiced	$\underset{\sim}{b}$ $\underset{\sim}{a}$	$\underset{\sim}{\square}$ Apical	$\underset{\sim}{t}$ $\underset{\sim}{d}$
$\underset{\sim}{t^h}$ $\underset{\sim}{d^h}$	~ Linguolabial	$\underset{\sim}{t}$ $\underset{\sim}{d}$	$\underset{\sim}{\square}$ Laminal	$\underset{\sim}{t}$ $\underset{\sim}{d}$
nded $\underset{\sim}{\text{ɔ}}$	w Labialized	$\underset{\sim}{t^w}$ $\underset{\sim}{d^w}$	~ Nasalized	$\underset{\sim}{e}$
ded $\underset{\sim}{\text{ɔ}}$	j Palatalized	$\underset{\sim}{t^j}$ $\underset{\sim}{d^j}$	$\underset{\sim}{n}$ Nasal release	$\underset{\sim}{d^n}$
$\underset{\sim}{u}$	y Velarized	$\underset{\sim}{t^y}$ $\underset{\sim}{d^y}$	$\underset{\sim}{l}$ Lateral release	$\underset{\sim}{d^l}$
$\underset{\sim}{e}$	ɣ Pharyngealized	$\underset{\sim}{t^\gamma}$ $\underset{\sim}{d^\gamma}$	$\underset{\sim}{\text{r}}$ No audible release	$\underset{\sim}{d^r}$
ed $\underset{\sim}{\ddot{e}}$	~ Velarized or pharyngealized	$\underset{\sim}{t}$		
ralized $\underset{\sim}{\ddot{e}^x}$	⊥ Raised	$\underset{\sim}{e}$ ($\underset{\sim}{\text{J}}$ = voiced alveolar fricative)		
$\underset{\sim}{n}$	Lowered	$\underset{\sim}{e}$ ($\underset{\sim}{\beta}$ = voiced bilabial approximant)		

Voiced and voiceless plosives: Word-final position

- Observe the consonant at the **end** of the following words in English:
 - /kæ**p**/ 
 - /kæ**b**/ 
- Then compare them with the consonant at the beginning of the following words in French:
 - /ka**p**/ (« cap »)
 - /ka**b**/ (« Cabe »)

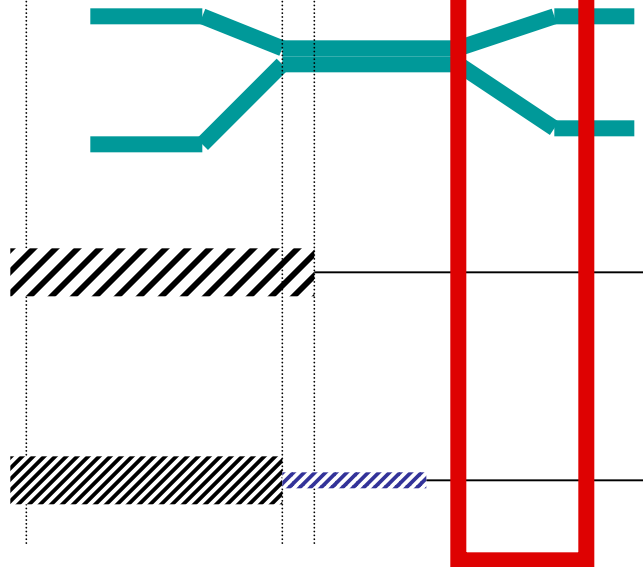
/kæp/

/kæp/



no audible release

release with no voicing

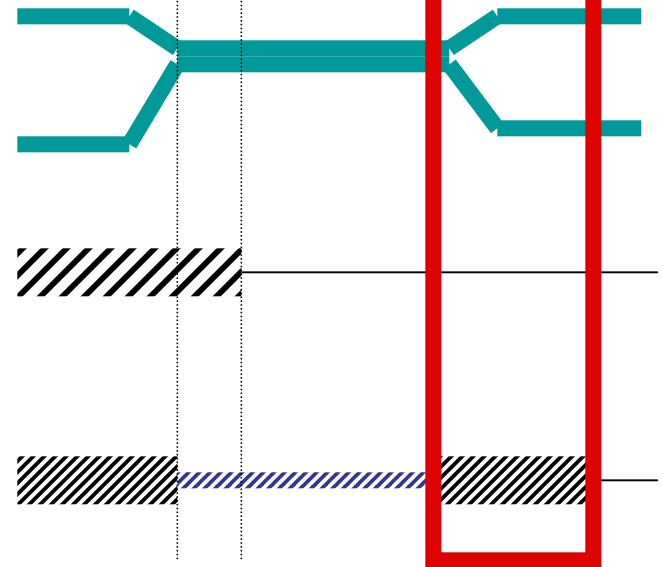


upper lip

lower lip

vocal fold vibration

initiation (airstream)



Voiced and voiceless plosives: Word-final position

The release phase of voiceless plosives

- /kæp/
- [k^hæ̃p] [k^hæ̃p̚] (no audible release)

The release phase of voiced plosives

- /kæb/
- [k^hæ̃b̚] but rarely [k^hæ̃b̚ə]


Voiced and voiceless plosives: Word-final position


- In English, word-final **voiceless** plosives can be pronounced with **no audible release** :
/kæp/ [k^hæ̃**p**] or [k^hæ̃**p̚**].
- Word-final **voiced** plosives are partially devoiced, and the voicing almost never lasts after release: /kæb/ [k^hæ̃**b̚**] but rarely [k^hæ̃**b̚ə**].

Relâchement non audible

- Cantonais

 [hip⁷ ˩] ‘to assist’ 協

 [hyt⁷ ˩] ‘blood’ 血

 [hɛk⁷ ˩] ‘to eat’ 吃

- Coréen

 [pap⁷] ‘cooked rice, meal’ 밥

 [w:mɕik⁷] ‘food’ 음식

 [su:bak⁷] ‘watermelon’ 수박

Les occlusives / plosives (stops)

Consonnes (pulmonaires)

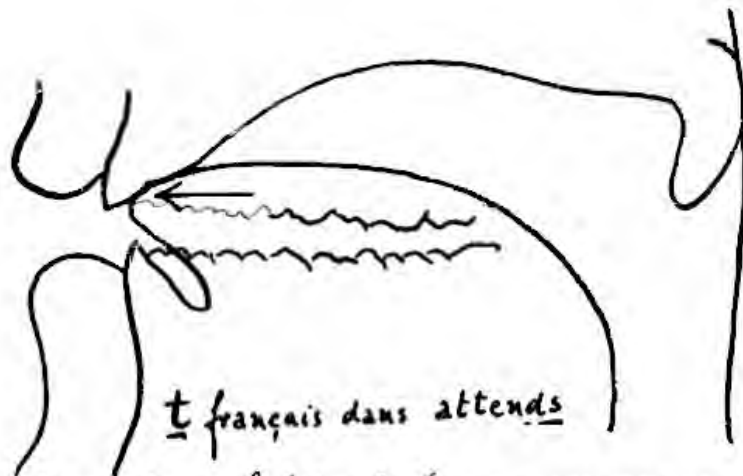
CONSONANTS (PULMONIC)

Dental / alvéolaire / postalvéolaire

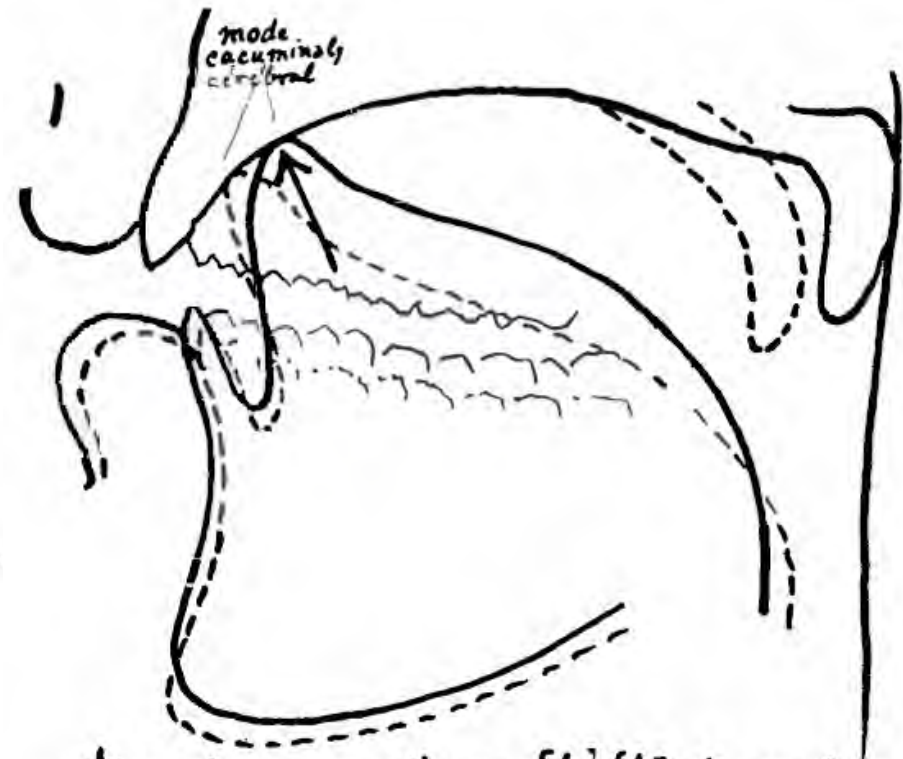
		Bilabial	Labiodental	Dental	Alveolar	Postalveolar	R
Plosive (orale)	Plosive(stop)	p b			t d		
Plosive) Nasale	Nasal	m	ɱ		n		
Vibrante	Trill	ʙ			r		
Battue	Tap or Flap		ɸ		ɾ		
Fricative	Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	
Fricative latérale	Lateral fricative				ɬ ɮ		
Proximante	Approximant		ʋ		ɹ		
Proximante latérale	Lateral approximant				l		

Where symbols appear in pairs, the one to the right represents a voiced consonant.

/t/ français et /t/ anglais : lieu d'articulation et forme de la langue



Mode articulaire habituel (roman, germanique, slave) :
la pointe agit à plat, horizontalement, par son dos.



t anglais dans town [t̟] [t̟] : ligne pleine
n anglais dans the sun [n̟] [n̟] : ligne hachée

- Straka, Georges (1965) *Album phonétique*

(occlusives) dentale / apicale / laminale

Diacritics may be placed above a symbol with a descender, e.g. $\overset{\circ}{\underset{\cdot}{j}}$

$\underset{\circ}{n}$ $\underset{\circ}{d}$	$\ddot{}$ Breathy voiced	$\underset{\circ}{b}$ $\underset{\circ}{a}$	$\underset{\square}{}$ Dental	$\underset{\square}{t}$ $\underset{\square}{d}$
$\underset{\downarrow}{s}$ $\underset{\downarrow}{t}$	\sim Creaky voiced	$\underset{\sim}{b}$ $\underset{\sim}{a}$	$\underset{\square}{}$ Apical	$\underset{\square}{t}$ $\underset{\square}{d}$
t^h d^h	\sim Linguolabial	$\underset{\sim}{t}$ $\underset{\sim}{d}$	$\underset{\square}{}$ Laminal	$\underset{\square}{t}$ $\underset{\square}{d}$
nded $\underset{\circ}{\underset{\cdot}{}}$	w Labialized	t^w d^w	\sim Nasalized	$\underset{\sim}{e}$
ded $\underset{\circ}{\underset{\cdot}{}}$	j Palatalized	t^j d^j	n Nasal release	d^n
$\underset{\dagger}{u}$	y Velarized	t^y d^y	l Lateral release	d^l
$\underset{\cdot}{e}$	$^{\text{r}}$ Pharyngealized	t^{r} d^{r}	$^{\text{r}}$ No audible release	d^{r}
ed $\underset{\cdot}{\underset{\cdot}{e}}$	\sim Velarized or pharyngealized	ɮ		
ralized $\underset{\times}{e}$	$^{\text{r}}$ Raised	$\underset{\cdot}{e}$ ($\underset{\cdot}{\text{J}}$ = voiced alveolar fricative)		
n	Lowered	e (β = voiced bilabial approximant)		

(occlusives) dentale / alvéolaire apicale / laminaire

- Many languages contrast dental and alveolar stops. This difference is almost always accompanied by a difference in laminality. All four of the possibilities, apical dental, laminal dental, apical alveolar and laminal alveolar occur, but languages rarely have contrasts in which one sound is apical and the other laminal with the contact being made at the same place on the roof of the mouth. In the languages we have investigated, dental stops are usually laminal rather than apical, with contact on both the teeth and the front part of the alveolar ridge, whereas the alveolar stops are often apical, with contact usually on the center of the alveolar ridge. (Ladefoged & Maddieson, 1996 *Sounds of the World's Languages*. p. 21)