

Affricates and the phonetic implementation of laryngeal contrast in Italian

1. Introduction

Aim of the paper: To show that affricates in Italian emerge as the phonetic implementation of three types of structures:

- a. [+high] coronals
- b. enhancement of place distinction
- c. enhancement of voicing distinction in stridents

Kehrein (2002): So-called affricates divide into three types of phonological structures:

- a. manner-specified stops
- b. place-driven affrication (see (b) above)
- c. *Laryngeally* driven affrication

Kehrein (2002): Non-strident affricates occur to enhance laryngeal contrasts.

(1) Laryngeally driven variation of stops (Kehrein 2002: 23)

laryngeal	Languages	stop	affricate
aspirated	Navaho Chipewyan Kabardian Chasta Costa Tahltan	k, k' k, k ^w , k', k ^{w'} j, c', q' q, q' k ^w , q, k ^{w'} , q'	k ^{xh} k ^{xh} , k ^{xwh} c ^{qh} , q ^{xh} q ^{xh} k ^{xwh} , q ^{xh}
ejective	R. Creek Sahaptin Lillooet, C. Tsimshian, Klamath !Xóǀ	p, t̚ q q, qh, G	p ^φ , t̚ ^θ q ^{x'} q ^{x'} , ^G q ^{x'}
plain voiceless	Chilcotin Nez Perce	q' q'	q ^x q ^x

Two observations:

1. Affrication is not tied to one laryngeal specification, i.e., [sg] or [cg].
2. The only laryngeal feature apparently not enhanced through affrication is [voice].

Krämer (here): Strident affricates emerge to enhance voicing contrast in fricatives in Italian.
Little problem: Strident affricates are phonologically stops. (Kim 2001, Kehrein 2002)

2. Northern Italian inventory asymmetries

(2) Zingarelli contrasts

- a. [tsaffata] 'badly smelling cloud' b. [dzaffera:no] 'saffron'
 [tsampa] 'leg' [dza:ino] 'backpack'
 [tsia] 'aunt' [dzi:goma] 'cheekbone'
 [tsukka] 'calabash, gourd' [dzuri:go] 'Zurich'
- c. [tsattera] / [dzattera] 'raft'
 [tsingaro] / [dzingaro] 'gypsy'
 [tsolla] / [dzolla] 'clod'

(3) Spontaneous judgement of (2a,c) by a northern Italian native speaker:

'Ma! Dove andiamo? Che [dz]uccone dice [ts]ia?'
 'What! Are you nuts? Which gourd says [ts]ia?'

(4) Northern Italian

- a. zeta [dzeta] 'z' c. gioco [dzoko] 'game'
 * [tseta] cioccolata [tʃokkolata] 'chocolate'
 seta [seta] 'silk' d. chiara [k'ara] 'clear'(f.)
 * [zeta] cara [kara] 'expensive'(f.)
 b. vino [vino] 'wine' ghiara/ghiaja [g'aja] 'Kiess'
 fino [fino] 'fine' gara [gara] 'competition'

(5) Gaps in the consonantal system in word-initial position in Northern Italian

	labial		anterior			posterior		dorsal	
voiceless	p	f	t		s	tʃ	ʃ	kʲ	k
voiced	b	v	d	dʒ		dʒ		gʲ	g

(6) "A feature is distinctive in a given segment if it is required to distinguish that segment from another." (Clements 2001: 78)

(7) Underlying representations for (5)

	[labial]		[coronal]				[dorsal]	
					[palatal]		[palatal]	
	/p/	/f/	/t/	/s/	/tʲ/	/ʃ/	/c/	/k/
[voice]	/b/	/v/	/d/	/z/	/dʲ/		/j/	/g/

3. Paduan affricates and voicing contrast

(8) The symmetric consonant system of Paduan Italian

	labial		anterior			posterior		dorsal	
voiceless	p	f	t		s	tʃ	ʃ		k
voiced	b	v	d		z	dʒ	ʒ		g

(9) Paduan

a. zeta	[zeta]	'z'	c. gioco	[ʒugo]	'game'
	* [tseta]		cioccolata	[(t)ʃokolata]	'chocolate'
seta	[seta]	'silk'	d. chiaro	[tʃaro]	'clear'
b. vino	[viŋ]	'wine'	caro	[karo]	'expensive'
fino	[fiŋ]	'fine'			

(10) Emergent affricates

	Standard	Paduan	
a. ghiaccio	[gʲattʃo]	[dʒaso]	'ice'
b. chiama	[kʲama]	[tʃama]	'he/she calls'

(11) The fate of affricates in Paduan

	Standard	Paduan	
a. zia	[dʒia]	[zia]	'aunt'
mezz'ora	[meddʒora]	[mezora]	'half an hour'
b. traduzione	[traduʦione]	[tradusiɔ̃]	'translation'
ragazzi	[ragattsi]	[ragasi]	'youths'
c. cena	[tʃena]	[sena]	'dinner'
comincio	[komintʃo]	[komiso]	'I start'
d. giochiamo	[dʒokiamo]	[zugemo]	'we play'
e. mangia	[mandʒa]	[maja]	'he/she eats'
viaggio	[viaddʒo]	[viajo]	'journey'
f. peggio	[peddʒo]	[pezo]	'worse'
Baggio	[baddʒo]	[baʒo]	a soccer player's name

☞ Palatalised dorsals are realised as affricates (PDA)

☞ affricates are realised as fricatives or glides

☞ voicing is retained

4. Comparison with German

(12) The consonantal system of German (word-initially)

	labial			anterior			posterior		dorsal
aspirated	p ^h	p ^f	f	t ^h	ts		(tʃ)	ʃ	k ^h
plain	b		v	d		z	(dʒ)	(ʒ)	g

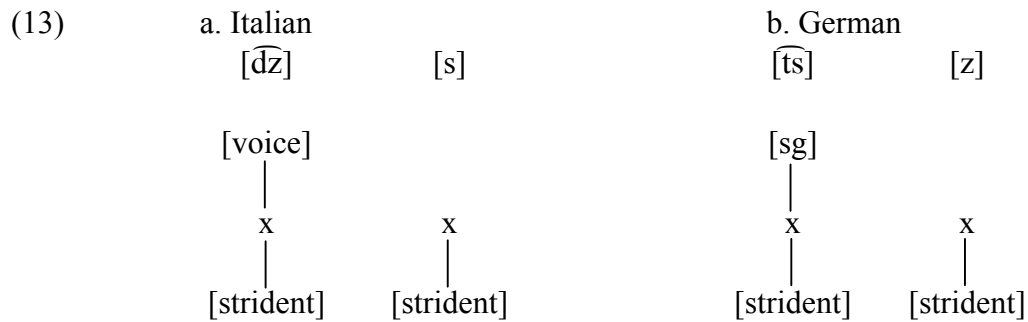
compared with Italian:

(4) Gaps in the consonantal system in word-initial position in Northern Italian

	labial		anterior			posterior		dorsal	
plain	p	f	t		s	tʃ	ʃ	k ^j	k
voiced	b	v	d	dʒ		dʒ		g ^j	g

Active laryngeal feature in German: [spread glottis] (see e.g. Jessen & Ringen 2002, Honeybone 2002, 2003, Iverson & Salmons 1995, 2003)

Active laryngeal feature in Italian: [voice]



In both languages, affrication emerges as a phonetic reflex of the more marked phonological structure.

4.1 Why should German strident affricates be analysed as fricatives?

(14) The 2nd German consonant shift (Penzl 1972, Sonderegger 1979)

	Old High German	Dutch	English
a.	[ts]unga	tong	tongue
	se[ts]en	zetten	set
	her[ts]a	hart	heart
	swar[ts]a	swart	swart
b.	e[s]an	eten	eat
	wa[s]er	water	water
	fuo[s]	voet	foot
	wa[s]	wat	what

Old High German assibilation has two outputs: [ts] and [s]

Kim (2001): spirantisation is addition of [strident] and deletion of [-cont]

Output of the 1st German consonant shift: fricatives.

(15) Germanic Enhancement (Iverson & Salmons 2003)

	b ^h b p	Indo-European laryngeal series
1.	b ^h b p ^h	Germanic Enhancement
2.	b ^h b φ	Spirantisation ('hyper-enhancement')
3.	b ^h p ^h φ	stop devoicing + 2 nd Germanic enhancement
4.	b p ^h φ	voiced aspirates simplify to voiced
	...	

Stage 3 here could only happen once the former plain stop series was changed into fricatives.

The output of the 2nd consonant shift are supposedly fricatives too, with the stop gesture a phonological enhancement of the laryngeal feature (GW or [sg]).

Problem:

(16) Vaux's Law (1998, as labelled by Averi & Idsardi 2001, Iverson & Salmons 2003):
Laryngeally unspecified fricatives become [GW]/[sg] in systems contrasting fricatives without reference to [GW]/[sg]).

⊗ Prediction: Italian fricatives should behave in parallel with German fricatives, not show mirror image pattern.

4.2 Loan word phonology and foreign accent

This section is intended to show that loan word phonology and L2 acquisition by adults do not qualify as a diagnostics of the validity of the claim advocated for, due to contamination of their phonology by orthographic conventions.

(17) Loan word adaptation and orthography

English/Japanese	Italian	German
a. [z] zapping	[dz]apping	[ts]appen
[z] zombie	[dz]ombie	[ts]ombie
b. [z] zoom	[dz]oom	[z]oom
[s] city	[s]ity	[s]/[z]/[ts]iti
[s] sex	[s]ex	[s]/[z]ex
[s] suchi	[suʃi]	[zʊʃi]
c. [s] cereals	[tʃ]ereali	[ts]erealien
d. jazz [z]	[dʒɛts]	[jats]/[dʒɛs]
e. Arizona [z]	Ari[dz]ona	Ari[ts]ona

Orthographic conventions are the determining factor behind loanword adaptation.

(18) Typical L2 learners' errors:

a. Italian learners of German:

[zosə]	→	[soze]	Soße	'gravy'
[tsa:n]	→	[dʒa:n]	Zahn	'tooth'

b. German learners of Italian:

[salvatore]	→	[zɛlvatorə]	Salvatore	a proper name
[dzabaione]	→	[tsabajonə]	Zabaione	an Italian dessert

5. Where do all these affricates come from?

Word-internally, strident affricates are abundant in Italian.

(19) Word-internal affricates

- | | | | |
|----------------------------|----------------------|-----------------------------------|---------------------------|
| a. pi[\widehat{tts}]a | ‘pizza’ | c. dri[\widehat{tts}]are | ‘straighten’ |
| pe[\widehat{tts}]o | ‘piece’ | agu[\widehat{tts}]are | ‘sharpen’ |
| pa[\widehat{tts}]o | ‘mad’ | d. corre[(t) \widehat{ts}]ione | ‘correction’ |
| pu[\widehat{tts}]a | ‘smell’ | astu[(t) \widehat{ts}]ia | ‘shrewdness’ |
| b. *pa[\widehat{ddz}]o | *Vl \widehat{dz} V | e. ra[\widehat{ts}]io | ‘ratio’ |
| *pa[\widehat{dz}]o | | La[\widehat{ts}]io | ‘Lazio’ (region in Italy) |
| *pa[\widehat{ts}]o | | | |

(20)

- | | | |
|------------|------------|----------------------|
| a. forte | forza | ‘strong/strength’ |
| alto | alzare | ‘high/raise’ |
| b. profeta | profezia | ‘prophet/prophecy’ |
| corretto | correzione | ‘correct/correction’ |
| astuto | astuzia | ‘shrewd/shrewdness’ |

(21) The posterior affricate

- | | | | |
|-----------------------------|-------------|----------------------------|-----------|
| a. pia[$\widehat{tʃ}$]ere | ‘pleasure’ | b. cu[$\widehat{dʒ}$]ino | ‘cousin’ |
| a[$\widehat{tʃ}$]endere | ‘switch on’ | cora[$\widehat{ddʒ}$]o | ‘courage’ |

1. [(d) \widehat{dz}] does not exist intervocalically;
2. The voiceless strident affricate is (almost) always long;
3. Most affricates are historically stops followed by a high vowel; (i.e., [stop] + [high])
4. Northern Italian does not allow intervocalic [s], Tuscan has a voicing contrast;
5. / $\widehat{tʃ}$ /, / $\widehat{ttʃ}$ /, / $\widehat{dʒ}$ /, / $\widehat{ddʒ}$ / all occur in intervocalic position.

(22) Northern Italian anterior coronals

voiceless	#t		#s	VtV	Vttv	VssV	(V \widehat{ts} V)	V \widehat{tts} V	
voiced	#d	# \widehat{dz}		VdV	VddV				VzV

- Thornton (1995):
- a. V \widehat{ts} V/V \widehat{tts} V derive from latin /...t#/ + [i]-initial suffix
 - b. Affrication rule is not active anymore synchronically.

(23) Blocking of spirantisation in Italian

- | | | | |
|------------|---------------|-----------|--------------|
| base | derived form | b. Egitto | egiziano |
| a. Haiti | haitiano | Marte | marziano |
| Tacito | tacitiano | Lilliput | lillipuziano |
| Kant | kantiano | | |
| Cristo | cristiano | | |
| Elisabetta | elisabettiano | | |

(Thornton 1995: 332)

Observation: all proper or place names for which stronger faithfulness restrictions might hold than for 'ordinary' nouns.

6. WYHIWYG Phonology

Non-surface-true contrast in a surface-oriented framework is a problem.

(24) A priori no problem to match underlying /x/ to surface [y]:

	IDENTIO (strident)	*z	MAX	IDENTIO (voice)	* \overline{dz}	IDENTIO (stop)
a. φ /z/ ~ \overline{dz}					*!	
b. /z/ ~ s				*!		
c. /z/ ~ \emptyset			*!			
d. /z/ ~ z		*!				
e. /z/ ~ d	*!					

(25) Underlying /y/ can hardly be avoided if surface [y] is allowed

	IDENTIO (strident)	*z	MAX	IDENTIO (voice)	* \overline{dz}	IDENTIO (stop)
a. φ / \overline{dz} / ~ \overline{dz}					*!	
b. / \overline{dz} / ~ s				*!		
c. / \overline{dz} / ~ \emptyset			*!			
d. / \overline{dz} / ~ z		*!				*
e. / \overline{dz} / ~ d	*!					

(26) Lexicon Optimization

	IDENTIO (strident)	*z	MAX	IDENTIO (voice)	* \overline{dz}	IDENTIO (stop)
a. φ / \overline{dz} / ~ \overline{dz}					*	
b. /s/ ~ \overline{dz}				*!	*	
c. /z/ ~ \overline{dz}					*	*!
d. /d/ ~ \overline{dz}	*!				*	

Solutions:

- Underlying /y/ is banned = reintroduction of constraints on inputs (e.g., *SPEC).
- Affricates are a matter of phonetics rather than phonology
 - Requires phonetic component that interpretes abstract phonological output on a language-specific basis (as proposed by Keating 1984, 1990);
 - or an evaluation of systems á la Dispersion Theory (Liljencrants & Lindblom 1972, Lindblom 1978, Flemming 1996)

7. Summary and conclusion

The sources of affricates in Italian:

- high coronal stops (palatalisation of /t/ before high vowel)
- additional place distinction (*tʃ*, *kʲ*) (palatalisation II)
- defiant voicing contrast (e.g., [dz] *ampa* can't be the result of palatalisation)

Affrication as phonetic enhancement of strident voicing...

- ☺ ...simplifies inventory of phonological representations;
- ☺ ...explains (positional) gaps in inventories;
- ☺ ...is used for the marked member of the laryngeal pair
(unlike with ejective/plain distinction; compare Klamath and Chilcotin in (1)).

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