

Fake geminates in French: a production and perception study

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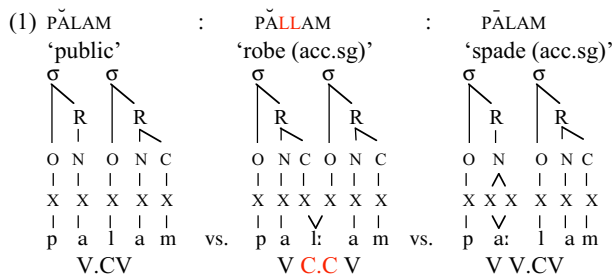
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Abstract

This paper examines the role of consonantal quantity from Latin to the Romance languages, concentrating on the situation in contemporary French, where fake or apparent geminates quite frequently arise in morpheme concatenation, often as a consequence of schwa deletion. A series of production and perception experiments shows that the required surface contrasts are neither represented nor identified consistently, speakers rather show a tendency to delete geminates in favor of a simplified syllable structure but at the cost of morpheme identity.

1. Quantity: From Latin to Romance

Classical Latin is known to have disposed of a quantity opposition in both, vowels and consonants [9]. In an autosegmental representation the short segments take up one, the long segments two X-positions on the timing tier [4]. In Latin long consonants or geminates, that often resulted from assimilation across morpheme boundaries [7], only appeared intervocally (or as obstruents in VOOLV constellations) occupying coda and onset position, thus allowing for three types of contrast, e.g.:



The fourth possible constellation **VVC.CV** has been abandoned preclassically by shortening either to **VC.CV** or to **VV.CV**, e.g. STĒLLA ‘star’ > STĒLA (> fr. *étoile*) or > STELLA (> it. *stella*) [8].

While **VV.C** vs. **VC.C** is distinctive in (1), these two patterns often constituted variants with one of them being considered non-standard [5], e.g.:

- (2) CŪPA (standard) ‘barrel’ > fr. [kyv] *cuve* ‘barrel’
 CŪPPA (non-standard) > fr. [kup] *coupe* ‘bowl’

Latin vowel quantity is abandoned until the end of the 3rd century [13], the Romance languages distinguishing their vowels by quality instead [12]. The abandonment of consonantal quantity – the process of degemination – occurs much later, i.e. in the 7th or 8th century, and it only occurs in those (Western Romance) varieties that have previously altered intervocalic singletons by the process of lenition [13]:

- (3) CŪPA
 > w.rom. [kuba] > sp. [kuβa] *cuba*, fr. [kyv] *cuve*
 > ea.rom. [kupa]
 SAPĒRE ‘to know’
 > w.rom. [saβer] > sp. [saβer] *saber*, fr. [savwaʁ] *savoir*
 > ea.rom. [sapere] > it. [sapere] *sapere*

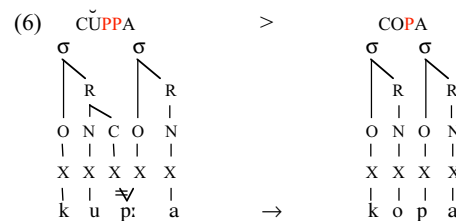
Degemination is thus typical for Western Romance languages while long and short consonants still contrast in Eastern Romance Italian:

- (4) CŪPPA
 > w.rom. [kopa] > sp. [kopa] *copa*, old fr. [kopə]
 > fr. [kup] *coupe*
 > italom. [koppa] > it. [koppa] *coppa*

Degemination joins the strong tendency of Romance languages towards open syllables. In an OT perspective this could be captured by a constraint *GEM, a specification of the more general markedness constraint NOCODA, that, dominated by MAXIO in Latin, comes to outrank this basic faithfulness constraint:

- (5) MAXIO » *GEM → *GEM » MAXIO

At some point listeners must have started to reanalyze the originally long consonants as short, what provoked the deletion of the coda consonant and consequently the loss of the corresponding X-position. At the end of this process geminates are no longer part of the lexical representation:



This analysis, however, is complicated by chronological divergences: While most geminates had been simplified before the period of Old French [11] as reflected in the spelling (e.g. old fr. *metre* ‘to put’ < MITTERE, old fr. *ele* ‘she’ < ILLA), the *rr*-geminate subsists much longer (old fr. *terre* ‘earth’ < TERRA). Its degemination occurs at the earliest in the 13th, at the latest in the 17th century [2, 5].

2. The situation in contemporary French

French thus is a language without lexical quantity contrasts, without underlying or “true” geminates. There are, however, “apparent” or “fake” geminates that can be classified as follows [5]:

Secondary geminates occur through etymological pronunciation of learned borrowings from Latin that contain a classi-

cally long consonant. French dictionaries (e.g. [10]) usually indicate two pronunciations in these cases, the geminate being considered as the educated form, “an elegant, extraphonological variant of the singleton” [3]:

- (7) *illégal* [i(l)legal] < lat. ILLLEGALIS (< IN+LEGALIS) ‘illegal’
irrél [i(ɣ)ʁeɛl] < lat. IRRREALIS (< IN+REALIS) ‘unreal’
innover [i(n)noʋe] < lat. INNOVARE (< IN+NOVARE) ‘to innovate’
sommaire [sɔ(m)mɛʁ] < lat. SUMMARIUM ‘summary’

This type will not be considered any further here.

Tertiary geminates in Lausberg’s [5] classification are sequences of identical consonants that arise from vowel deletion, i.e. mainly schwa deletion in French.

Atonic (Latin) vowels have been deleted in the synthesized forms of the new (Protoromance) future and conditional paradigms [6], eventually leading to the special case of a *morphologically induced vibrant geminate* within the word domain. It consists of a stem final *r* plus the future/conditional morpheme *r* which distinguishes the corresponding paradigms from the contrasting forms of the imperfect tense that only display a short or singleton vibrant:

- (8) *VĒNDERE HABEO > *VEND(E)RAIO → *je vendrai* ‘I shall sell’
 *CURRĒRE HABEO > *CURR(E)RAIO → *je courrai* [kuɣɣɛ] ‘I shall run’
 *MORĪRE HABEO > *MOR(I)RAIO → *je mourrai* [muɣɣɛ] ‘I shall die’
 stem [kuɣ-/muɣ-] + fut./cond. morpheme [-ɣ-] + P/N →
je courrais [kuɣɣɛ] vs. *je courais* [kuɣɛ]
je mourrais [muɣɣɛ] vs. *je mourais* [muɣɛ]
 1.sg.cond. 1.sg.imp.

The same type of contrast is created by schwa deletion in *-er* verbs whose stems end in *r*:

- (9) *il déclarerait* [-klaɣɣɛ] vs. *il déclarait* [-klaɣɛ] 3sg.cond. 3sg.imp. ‘to declare’
tu déchirerais [-fiɣɣɛ] vs. *tu déchirais* [-fiɣɛ] 2sg.cond. 2sg.imp. ‘to tear’

Schwa deletion (or non emergence) at morpheme boundaries is the reason of many other fake geminates in French, either within the word domain or between adjacent words, e.g.:

- (10) *netteté* [nette] ‘neatness’
pierreries [pjeɣɣi] ‘gemstones’
extrêmement [ɛkstɛmmɛ̃] ‘extremely’
là-dedans [ladɔ̃] ‘in there’
il (ne) coupe pas [kuppa] ‘it doesn’t cut’
bonne nouvelle [bɔnnuveɛl] ‘good news’
robe bleue [ɔɔbblø] ‘blue dress’

Such *position-induced geminates* at word boundaries can also occur without the (non-)intervention of a schwa, e.g.:

- (11) *avec quoi* [avekkwa] ‘with what’
pour Raymond [puɣɣɛmɔ̃] ‘for Raymond’
œuf frais [œffɣɛ] ‘fresh egg’
mal léger [malɛɣɛ] ‘light sickness’
il l’a dit [illadi] ‘he has said it’

Quite a few differences in meaning derive solely from the geminate/singleton contrast, e.g.:

- (12) *là-dedans* [ladɔ̃] vs. *la dent* [ladɔ̃] ‘in there’ ‘DET.F tooth’
il coupe pas [kuppa] vs. *il coupa* [kupa] SUBJCL3S.M cut:3S.PRS NEG SUBJCL3S.M cut:3S.PRF
tu me mens [tymmɛ̃] vs. *tu mens* [tymɛ̃] SUBJCL2S OBJCL1S lie:2S.PRS SUBJCL2S lie:2S.PRS
tu te trompes [tytɣɣɔ̃p] vs. *tu trompes* [tytɣɔ̃p] SUBJCL2S OBJCL2S cheat:2S.PRS SUBJCL2S cheat:2S.PRS
il l’a dit [illadi] vs. *il a dit* [iladi] SUBJCL3S.M OBJCL3S AUX say:PRT SUBJCL3S.M AUX say:PRT

The last contrast illustrated under (12) can be seen as the point of departure for an interesting interaction between phonology and morphology: Carvalho [1] reports a reanalysis of the lateral geminate in Parisian French, where the long consonant as a whole is taken for the object clitic and, by analogy, extended to all occurrences before vowel initial words:

- (13) *il l’a dit* [il+I+a+di] reanalyzed as [i+II+a+di]
 extended to [ɔ̃+II+e+di] → [ɔ̃IIedi] *je l’ai dit*
 SUBJCL1S OBJCL3S AUX say:PRT
 [ɔ̃+II+a+di] → [ɔ̃IIadi] *on l’a dit*
 SUBJCL3S.INDEF OBJCL3S AUX say:PRT etc.

3. Data

In order to examine the functioning of long consonants in contemporary French and to obtain a better understanding of their phonetic and acoustic reality, a series of production and perception experiments was conducted at the university of Osnabrück (Germany) in May and June 2004.

3.1 Production experiment

For the production experiment 12 native speakers of French (exchange students from different French and francophone regions) were recorded. The task, camouflaged as a combined word finding and reading speed test, consisted in responding as fast as possible to a total of 48 visual, mainly written stimuli among which the following three cases of consonantal quantity contrasts were interspersed:

- (14) *Ça me frappe pas vraiment.* ‘This doesn’t really hit me.’
Il le frappa deux fois. ‘He hit him twice.’
 contrast [p] vs. [p:] (position-induced geminate)

- (15) *S’il continuait ainsi, il courrait le risque de perdre son poste.*
 ‘If he continued this way, he’d run the risk of losing his job.’
Un des poneys s’était cogné un œil et il courait le risque de rester aveugle.
 ‘One of the ponies had bumped his eye, and he ran the risk of going blind.’
 contrast [ɣ] vs. [ɣ:] (morphologically induced geminate)

- (16) – *Il a dit qu’il viendrait ?* – *Oui, il l’a dit.*
 ‘Did he say that he’d come? Yes, he’s said it.’
 – *Pourquoi t’as pas dit stop ?* – *Mais je l’ai dit !!!!*
 ‘Why didn’t you say stop? But I’ve said it!!!!’
 contrast [I] vs. [I:] (position-induced geminate and eventually reanalysis)

The DAT recordings were transferred to a computer, transformed to sound files and thoroughly analyzed with the software Praat; oscillograms and spectrograms were obtained and used to measure the duration of the relevant consonants. Subsequently the contrasting portions were cut out, mixed with other items and integrated in a perception experiment.

(17)

1 AH <input checked="" type="checkbox"/> il a dit <input type="checkbox"/> il l'a dit ✓	5 <input type="checkbox"/> on entend <input checked="" type="checkbox"/> on n'entend ✗	9 <input checked="" type="checkbox"/> il courait ✓ <input type="checkbox"/> il courrait ✓
2 <input checked="" type="checkbox"/> on entend ✓ <input type="checkbox"/> on n'entend	6 <input checked="" type="checkbox"/> frappa ✓ <input type="checkbox"/> frappe pas	10 <input checked="" type="checkbox"/> on entend ✓ <input type="checkbox"/> on n'entend
3 <input type="checkbox"/> en évitant ✓ <input checked="" type="checkbox"/> en n'évitant	7 <input checked="" type="checkbox"/> en évitant ✓ <input type="checkbox"/> en n'évitant	11 <input checked="" type="checkbox"/> frappa ✗ <input type="checkbox"/> frappe pas

3.2 Perception experiment

The perception experiment was conducted in form of a forced choice task. A total of 167 audio stimuli from the precedent production experiment were presented to 16 native speakers of French (partly identical with those who had participated in the production experiment). While listening to the stimuli, they were asked to tick on the accompanying sheets which of the contrasting items in a pair they had identified. Inside the pairs the items were always presented in the same order: first the less complex, then the more complex stimulus. (17) shows part of the first sheet, filled out by subject AH; the stimuli relevant for this study have been circled.

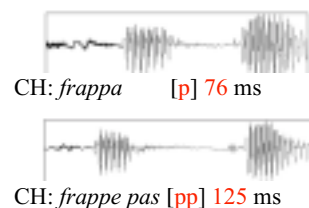
4. Results

The results of both experiments are summarized under (18), where the 12 speakers of the production experiment are listed in the left column. The first line for each person gives the results of the perception experiment, 'c.' standing for the correct identification of the intended consonant, 'f.' for false identification, the numbers adding up to the 16 participants of this test. The second line shows the duration measurements for the relevant consonants in seconds. The produced and mainly identified cases of contrast pairs are shaded.

(18)		fra[p]a	fra[p:]as	Il cou[ɹ]ait	Il cou[ɹ:]ait	I[l] a dit	I[l:]'a dit	je [l(:)]'ai dit
AB ^{perc}		c.13 f. 3	f. 3 c.13	c.14 f. 2	f. 1 c.15	c.13 f. 3	f. 1 c.15	
AB ^{prod}		0.083	0.145	0.058	0.114	0.051	0.110	0.112
AH ^{perc}		c.14 f. 2	f. 2 c.14	c.15 f. 1	f.13 c. 3	c.15 f. 1	f. 1 c.15	
AH ^{prod}		0.062	0.142	0.020	0.037	0.035	0.111	0.058
AM ^{perc}		c.14 f. 1	f.10 c. 6	c.16 f. 0	f. 5 c.11	c.13 f. 3	f. 3 c.13	
AM ^{prod}		0.061	0.103	0.058	0.102	0.042	0.097	?.???
BP ^{perc}		c.15 f. 1	f. 1 c.15	c.12 f. 4	f.16 c. 0	c.14 f. 2	f. 0 c.16	
BP ^{prod}		0.073	0.217	0.039	0.053	0.026	0.128	0.113
CH ^{perc}		c.14 f. 2	f. 3 c.13	c.16 f. 0	f. 1 c.15	c.10 f. 6	f. 0 c.16	
CH ^{prod}		0.076	0.125	0.060	0.153	0.057	0.098	(0.084)
DO ^{perc}		c.15 f. 1	—	c.15 f. 1	f. 1 c.15	c. 2 f.14	f. 2 c.14	
DO ^{prod}		0.077	—	0.053	0.125	0.077	0.105	0.046
EM ^{perc}		c.11 f. 5	f. 5 c.11	c.16 f. 0	f.16 c. 0	c.16 f. 0	f. 0 c.16	
EM ^{prod}		0.103	0.115	0.042	0.050	0.027	0.116	0.033
FC ^{perc}		c.15 f. 1	f. 0 c.16	c.15 f. 1	f. 6 c.10	c.14 f. 2	f. 0 c.16	
FC ^{prod}		0.065	(0.367+ ^a)	0.037	0.070	0.040	0.091	(0.085)
JM ^{perc}		c.10 f. 6	f. 0 c.16	c.15 f. 1	f.14 c. 2	c.13 f. 3	f. 1 c.15	
JM ^{prod}		0.096	(0.230+ ^h)	0.042	0.061	0.044	0.095	0.043
LB ^{perc}		c. 5 f.11	f. 0 c.16	c.14 f. 2	f.14 c. 2	c.13 f. 3	f. 1 c.15	
LB ^{prod}		0.144	0.140	0.050	0.044	0.054	0.167	(0.074)
ML ^{perc}		c. 2 f.14	f. 0 c.16	c.16 f. 0	f.12 c. 4	c.10 f. 6	f.10 c. 6	
ML ^{prod}		0.186	0.160	0.024	0.050	0.061	0.060	0.063
YT ^{perc}		c.14 f. 1	f. 1 c.15	c.16 f. 0	f.16 c. 0	c.16 f. 0	f.13 c. 3	
YT ^{prod}		0.070	0.174	0.050	0.045	0.053	0.065	0.058

In 7 out of 11 exploitable sound files for *fra[p]a* vs. *fra[p:]as* the speakers had produced an obvious duration contrast between the plosives, in the other four there was no clearly perceptible difference. Up to 85 ms the plosive is generally identified as short, while divergence occurs around 100 ms (± 15), and higher values are rather identified as long. In two cases the morpheme border is marked by a schwa between the consonants or by an aspiration. (19) shows the oscillograms of the utterances produced by speaker CH:

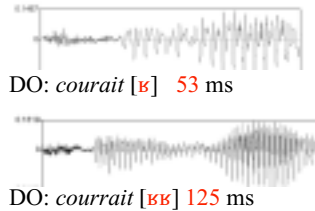
(19)



For two speakers (LB and ML) the singleton plosive in *frappa* turns out to be longer than the geminate in *frappe pas*.

Only 3 out of 12 speakers produce a clear durational distinction between the vibrants in *cou[ʁ]ait* vs. *cou[ʁ:~ʁ:]ait*. The sound files of the 8 others exhibit little or no difference. Up to around 60 ms the vibrant is rather identified as short, from 100 ms on it is mostly perceived as long; neutralization occurs in favor of the short consonant. (20) shows the oscillograms of the utterances produced by speaker DO:

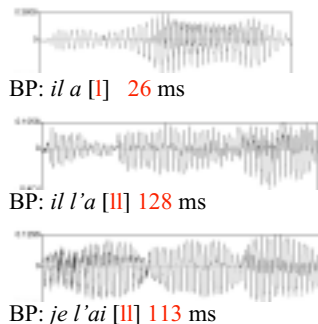
(20)



The contrast between the laterals in *I[ɥ] a dit* vs. *I[ɥ:] 'a dit* is plainly represented and perceived in the utterances of 8 speakers, while only 4 exhibit little or no difference between the two forms. In two of these cases (CH and DO) it is the short consonant that tends to be perceived as long, while the long one is equally identified as long. In the other two cases the duration of the geminate is clearly reduced.

For the eventual reanalysis of the long lateral and its analogical extension to the lateral in the utterance *Mais je l'ai dit !!!!*, yielding *je [ɥ:] 'ai dit*, there is no data available from the perception test. In 11 cases the lateral could be measured, in two of these (AB and BP) it shows a clearly long lateral, three more exhibit intermediate values (in parenthesis in (18)), in the other six there is obviously a short lateral. (21) shows the oscillograms of speaker BP who has produced a long lateral in both *I[ɥ:] 'a* and *je [ɥ:] 'ai dit*.

(21)



5. Discussion and Conclusion

The aim of this study was to take a closer look at consonantal quantity in contemporary French. The results of the production experiment show that none of the investigated contrasts is consistently produced by the speakers. This is corroborated by the perception experiment, where none of the investigated contrasts is consistently identified. The difference between long and short consonants can thus be neutralized at the surface, and duration is consequently reduced. The situation in modern French seems roughly identical to that in Proto-Romance, where the coda X-positions of geminates were gradually deleted, and French *coupe pas* 'doesn't cut' shows the same behavior as Latin CUPPA, illustrated in (6): [kup+pa] → [kup.pa] may be reduced to [kupa].

Reduction has gone farthest in the case of the morphologically induced geminate that differentiates between the paradigms of the conditional or future on the one and the imperfect tense on the other side in verbs like *courir*. The distinction between these modes and tenses seems to be superfluous here and is perhaps captured otherwise.

Reduction is less frequent (but nevertheless possible) for the position-induced geminate in *frappe pas*.

Most occurrences of a long consonant were found in the combination of the third person subject and object clitics as in *il l'a dit*. Speakers and listeners seem to benefit from the morphosyntactic information provided by this geminate.

Evidence for the clitic's reanalysis as a long lateral and its analogical extension to other occurrences before vowel is much scarcer, although the emphatic context in *Mais je l'ai dit !!!!* should have enhanced the duration of the consonant.

Long consonants in French are optional: Not relevant on the phonological level, they contribute to assure the stability of morphemes, but may be reduced for the sake of simplified syllable structures.

6. References

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