

LEXICAL ACCESS IN ITALIAN: WORDS WITH AND WITHOUT PALATALIZATION

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1. INTRODUCTION

Velar palatalization is a fairly common process in Romance. Its roots are to be found in late Latin, although its distribution (as well as its phonetic implementation) differs from variety to variety, suggesting that the process was still expanding at the time when Romance languages arose. The phonetic trigger is quite obvious, for it consists of the advanced point of articulation induced by front vowels on preceding velar consonants. One may thus reasonably assume that this phonological process was fairly regularly applied at some point in time (and possibly for an extended period). Indeed, this has left abundant traces in the phonology of most Romance languages, specifically in root-internal positions, as shown by the following Italian examples: [tʃ]elo 'heaven', la[tʃ]erto 'biceps', auda[tʃ]e 'bold', from Latin CAELŪM, LACERTŪM, AUDĀCĒM. The present distribution in most Romance varieties, however, shows that palatalization is no more active as an across-the-board phonetic process. This is certainly the case in Italian, where palatalization (as a synchronic phonological mechanism) is now restricted to morphophonological environments, apart from its presence as a result of historical change. This is reflected in the lexical shape of existing words like the ones quoted above, whose phonological representations involve palatal phonemes. Moreover, palatalization in Modern Italian is only triggered by the front high vowel /i/, whereas the examples quoted show that in the past it was also caused by the front mid vowels /e ε/. Most importantly, one now observes a somewhat capricious distribution, as witnessed by examples such as those in (1):

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- (1) a. *medico* /'mɛdiko/ 'physician', *medici* /'mɛditʃi/ 'physicians' or *filologo* /fi'lɔlogo/ 'philologist', *filologi* /fi'lɔloʒi/ 'philologists',
 AS OPPOSED TO:
 b. *buco* /'buko/ 'hole', *buchi* /'buki/ 'holes' or *lago* /'lago/ 'lake', *laghi* /'lagi/ 'lakes';
 c. *induco* /in'duko/ 'induce.1SG', *induci* /in'dutʃi/ 'induce.2SG' or *prediligo* /predi'ligo/ '(strongly) prefer.1SG', *prediligi* /predi'liʒi/ '(strongly) prefer.2SG'
 AS OPPOSED TO:
 d. *predico* /'prɛdiko/ 'preach.1SG', *predichi* /'prɛdiki/ 'preach.2SG' or *indago* /in'dago/ 'investigate.1SG', *indaghi* /in'dagi/ 'investigate.2SG'.

As may be seen, one and the same inflectional operation (plural formation in a-b, person inflection in c-d) produces different results, so that the speaker cannot foresee the correct output on mere phonotactic grounds. Things get only apparently better with derivation: although most derivational affixes behave regularly, this often introduces an asymmetry with respect to the behavior of one and the same basis as far as inflectional processes are concerned. For instance, both *-ità* and *-izia* yield palatalization disregarding the possible absence of palatalization in the plural of the bases they are attached to, as in (2a,c) as opposed to (2b,d):

- (2) a. *pratico* /'pratiko/ 'practical', *pratici* /'pratitʃi/ 'practical.PL', *praticità* /pratitʃi'ta/ 'practicalness'
 AS OPPOSED TO:
 b. *mendico* /men'diko/ 'mendicant', *mendichi* /men'diki/ 'mendicant.PL', *mendicITÀ* /menditʃi'ta/ 'mendicity';
 c. *amico* /a'miko/ 'friend', *amici* /a'mitʃi/ 'friends', *amicizia* /ami'tʃitsja/ 'friendship'
 AS OPPOSED TO:
 d. *impudico* /impu'diko/ 'wanton', *impudichi* /impu'diki/ 'wanton.PL', *impudicizia* /impudi'tʃitsja/ 'wantonness'.

In the next section, we shall provide an overview of the morphological impact of palatalization in Italian. Here, we would like to anticipate that, given the situation, it is interesting to investigate its possible consequences in terms of lexical access. In this regard, one may formulate three different hypotheses. If palatalization were an absolutely regular phenomenon, one might suggest (HYPOTHESIS 1) that its implementation should bring about a measurable processing cost, due to the morphophonological operation involved in it. Thus, for instance, producing the plural *ami[tʃ]i* (from *ami[k]o* 'friend') should yield a higher cost, hence take longer, than producing the plural *tavoli* (from *tavolo*

'table'), where no change occurs in the root. If, on the other hand, palatalization is an unpredictable process – as is ostensibly the case in Italian – to the extent that the speaker cannot decide on the basis of phonotactic information whether the plural of *amico* is actually **ami[k]i* or *ami[tʃ]i*, then the expectation might be (HYPOTHESIS 2a) that the speaker must directly access the plural of any noun or adjective whose root ends in a velar stop. In other words, the plural allomorph of the latter words should be explicitly listed in the mental lexicon, as opposed to the regular plural of non-velar-ending words, which would be computed compositionally. The processing cost inherent in producing *tavoli* from *tavolo* would thus be higher than the cost involved in producing both *ami[tʃ]i* (from *ami[k]o*) and *sara[g]i* (from *sara[g]o* 'type of fish'). Alternatively, one might claim (HYPOTHESIS 2b) that the speaker only applies a thoroughly regular (thus, compositional) morphological operation in non-palatalizing words (e.g., plural formation in *tavoli* from *tavolo* and *sara[g]i* from *sara[g]o*), while having direct, thus faster, access to the inflected forms in the case of words diacritically marked for palatalization (as in *ami[tʃ]i* from *ami[k]o*). Although it is not clear what advantage the speaker could derive from the last solution, this is a theoretically conceivable option. One reason (admittedly, one among other possibilities) to believe that this might be the case would be to find out that, e.g., the plurals of palatalizing nouns and adjectives (and possibly even their singulars) are accessed faster than plurals of words with non-palatalizing velar-ending roots.

In the next section, we provide some preliminary data about the morphological distribution of velar palatalization in Italian, with respect to the three processes involved in it, namely, plural formation and verbal declension (§ 2.1), derivation (§ 2.2). We will make reference to both ancient and contemporary Italian. In the following section (§ 3), we will deal with the experimental investigation, relating to a lexical decision task applied to nouns with and without morphophonological palatalization. The last sections (§§ 4 and 5) contain the general discussion and conclusions.

2. AN OVERVIEW OF THE MORPHOLOGICAL DISTRIBUTION OF PALATALIZATION IN ITALIAN

2.1. Palatalization in Inflection

Velar palatalization in Romance was once a phonetically grounded process and as such it generalized to every position in the word and applied throughout the whole lexicon. Nevertheless, it now appears to be lexicalized and only weakly

productive in derivation. For this reason, the process of plural formation of words ending in a velar consonant represents a highly problematic area as far as its occurrence and distribution in contemporary Italian are concerned.

As hinted at above, masculine nouns and adjectives ending in [ko] and [go] in the singular do not constitute a homogeneous inflectional class, since plural formation (by *-i* suffixation) can yield two different results with respect to the preceding consonant. Some words retain the velar in plural formation ([ki] and [gi], orthographically *-chi* and *-ghi*); others change it into palatoalveolar affricates ([tʃi] or [dʒi], orthographically *-ci* and *-gi*)¹. Examples are *baco* – *bachi* 'worm(s)' and *lago* – *laghi* 'lake(s)' for the first type, *amico* – *amici* 'friend(s)' and *filologo* – *filologi* 'philologist(s)' for the second.

Traditionally, the forms with palatalization were considered to be the regular output of the plural formation rule, and those with velar retention were regarded as exceptions. Meyer-Lübke (1901, § 339) related the palatalized forms to the Late Latin palatalization rule affecting any velar stop before palatal vowels, and suggested a case by case explanation for the forms with velar retention, considered as pertaining to ancient inflectional classes with different plural formation (e.g. *fichi* 'figs' from Lat. FICŪS, 4th conjugation; *antichi* 'ancient.PL' from Lat. ANTIQUI with labiovelar; *fuochi* 'fires' from Ancient Italian *f(u)ocora*), or late formations (e.g. *carichi* 'loads', a Romance deverbal formation from *caricare*; *fondachi* 'warehouses' from Ar. *fondog* etc.). From a radically different perspective, Goidanich (1940) argued that the [ki]/[gi] forms represented the ordinary outcome in Ancient Italian, in view of their wide diffusion in Tuscan rural areas' vulgar speech, while the forms with palatalization had purportedly been restored by the upper class as Latinized prestigious forms.

The hypothesis that the palatalized forms used to be the regular output can be supported by some individual cases. Consider the adjective *pudico* – *pudichi* 'modest' as an example. Although the adjective is an inherited form (from Lat. PŪDĪCUS, -I), it presents velar retention in the plural. On the other hand, the derived noun *pudicizia* 'modesty', which also has a Latin origin (suffixation through *-ĭTĪA* was very common in Latin), shows palatalization. There are just three nouns ending in *-izia* in Italian: *amicizia* 'friendship' (with its opposite *inimicizia*), *sporczia* 'dirtiness' and *pudicizia* itself (with

¹ Considering that we are often going to quote the examples in orthographic form, the reader not familiar with the Italian orthography should be aware that the conventions are somehow reversed with respect to the English standard, inasmuch as <ch> and <gh> stand for the non-palatalized phonemes, while <c> and <g> stand (before <i>) for the palatalized ones.

its opposite *impudicizia*), all with palatalization; no word ends in *-chizia*. In *amico-amici-amicizia* 'friend-friends-friendship' we have regular palatalization in both inflected and derived forms. On the other hand, *sporcizia* alternates with *sporco-sporchi* 'dirty' (Latin precursors: SPŮRCĪTĪA and SPŮRCŮS, -I, respectively), following the same pattern of *pudico-pudichi-pudicizia*:

(3)	<i>Adj. Sg.</i>	<i>Adj. Pl.</i>	<i>Noun</i>	<i>Gloss</i>
	sporco	sporchi	sporcizia	'dirty, dirtiness'
	pudico	pudichi	pudicizia	'modest, modesty'

AS OPPOSED TO:

<i>Adj. Sg.</i>	<i>Adj. Pl.</i>	<i>Noun</i>	<i>Gloss</i>
amico	amici	amicizia	'friend, friendship'

As far as *pudico-pudichi-pudicizia* is concerned, however, we have evidence of a different situation in ancient Italian. The palatalized form *pudici* is used by Dante (*Convivio* 4, 25.5), Boccaccio (both 14th Century) and Tasso (16th Century), while *pudichi* appears in works by Arienti, Berni, Guicciardini and Tasso again (all 16th Century); as for the 17th and 18th centuries, we find alternations between the two forms in writers such as Marino, Vico and Metastasio. We might then conclude that the form *pudici* with palatalization, that we would expect on the basis of the regular derivation from Latin, existed in ancient Italian, but soon entered in competition with a newly restored non-palatalized form, possibly arising as analogical formation on the singular. The non-palatalized form represents today the only possibility for the plural of *pudico*. On the other hand, we have no evidence of a form **sporci* in Ancient Italian, and we may reasonably suppose that it never existed. We are thus faced with a case of lexical idiosyncrasy, which seems to be widespread in Italian morphophonological palatalization.

It is not easy to establish which type of plural formation quantitatively prevails in Ancient Italian. As Rohlfs (1966) points out, cases like A.It. *pudici* (for Mod.It. *pudichi*) are rather common, and many adjectives or nouns now ending in *-chi* are attested with palatalization in some ancient literary texts: cf. *antici* 'ancient.PL', *caduci* 'transient.PL', *vinci* 'wickers', *bieci* 'sullen.PL', *cuoci* 'cooks', as opposed to Mod. Italian *antichi*, *caduchi*, *vinchi*, *biechi*, *cuochi*. By contrast, most adjectives ending in *-ico* now have a plural in *-ici* (like *fantastico-fantastici* 'fantastic', *pubblico-pubblici* 'public', *autentico-autentici* 'authentic'), while in past centuries writers frequently used *fantastichi* (Sacchetti, 14th century), *pubblichichi* (Boccaccio, 14th century), *autentichichi* (Tasso, 16th century). In some cases, we find free oscillation, as in Boccaccio for *magnifici* and *magnifichi* 'beautiful.PL', *poetici* and *poetichi* 'poetic.PL' (where only

the palatalized forms have survived). Historians and grammarians of the 16th century used both *ecclesiastici* and *ecclesiastichi* 'ecclesiastic.PL' (Guicciardini), *pacifici* and *pacifichi* 'peaceful.PL' (Machiavelli), *selvatici* and *selvatichi* 'wild.PL' (Cellini, Bembo) and so on. Alternating forms for one and the same lexical item are also common in the contemporary language, as we shall see below.

For words ending in *-go*, the situation is equally confused. Adjectives and nouns attested without palatalization in the contemporary language, like *guardinghi* 'cautious.pl' and *dialoghi* 'dialogues', frequently appeared as *guardingi* and *dialogi* in the past centuries (cf. Varchi, Tasso).

Furthermore, the class of feminine nouns and adjectives in *-ca*, which nowadays shows without exception the ending *-che* [ke] in the plural, sporadically presented palatalization in Ancient Italian: cf. *amice* 'friend.FEM.PL', *formice* 'ants', *lunge* 'long.FEM.PL', *biece* 'sullen.FEM.PL', *force* 'forks' (Rohlf's 1966). Rohlf's suggests that the preference for the *-che* form should be related to the persistence of *-ca* < *-CAS* plurals in Tuscany until recent times (cf. Florentine *le formica* 'the ants').

The plural palatalization process mostly shows a lexically idiosyncratic distribution in Mod. Italian, and this can lead to uncertainty by native speakers. The quantitative data collected through the scrutiny of electronic databases are revealing. According to the DISC dictionary (Sabatini and Coletti 1997), 4013 nouns and adjectives with singular in *-co* have palatalization, while only 797 have velar retention. Among nouns, the situation is more balanced (715 with palatalization, 525 with velar retention), whereas among adjectives palatalization largely prevails (3880 vs. 374). As for words pertaining to both lexical classes, i.e. words that may be both adjectives and nouns, palatalization wins again (582 vs. 102).

Note that the vast majority (3922 out of 4013) of words with *-co/-ci* alternation are formed by means of the highly productive *-ico/-ici* termination (mostly from Lat. *-ĪCUS*, e.g. *poetico-poetici* 'poetic', *tragico-tragici* 'tragic'). These words are predominantly adjectives; their morphotactic complexity (suffixation through *-ico*) can be either low, as in transparent words such as *poetico* 'poetic' from *poeta* 'poet', *germanico* 'Germanic' from *Germania* 'Germany', or relatively high, as in opaque words such as *medico* 'doctor' < Lat. *MĒDICUM* from *MĒDERI* 'to take care'. Words ending in *-ico* presenting velar retention are no more than 66 out of 797, mostly deverbal formations as in the case of *valico-valichi* 'mountain pass' from *valicare* 'to cross over', *carico-carichi* 'load' from *caricare* 'to load'.

Another interesting subset is represented by words ending in *-sco* [sko]. Their plural involves velar retention ([ski]) in all cases, e.g. *brusco-*

bruschi 'rude'. The only exceptions are two words in which palatalization involves the change of the sequence 'sibilant + velar stop' into the palatal fricative [ʃ]: cf. *fali*[sk]o–*fali*[ʃ:]i and *vol*[sk]o–*vol*[ʃ:]i, both nouns referring to Italic populations (and also used for the corresponding adjectives).

As far as the voiced velar is concerned, the two opposing classes (palatalizing and non-palatalizing) are numerically equivalent: 239 plurals (of nouns and adjectives) present a palatal affricate, 242 retain the velar stop. Note, however, that composition through *-logo* leads to palatalization more often than velar retention (195 vs. 40), so that the type *filologo*–*filologi* 'philologist(s)' appears to be more frequent than the type *eterologo*–*eterologhi* 'heterologous(SC., PL.)' or *catalogo*–*cataloghi* 'catalogue(s)'. The same is true for compounding through *-fago*: 31 plurals present palatalization (e.g. *esofago*–*esofagi* 'esophagus/i'), while only 2 retain the velar (i.e. *polifago*–*polifaghi* 'polyphagous(SC., PL.)' and *sarcofago*–*sarcofaghi* 'sarcophagus/i'; but the latter can also appear as *sarcofagi*). On the contrary, the suffixes *-fugo* and *-gogo* show velar preservation in every instance (N= 14).

This indicates that the lexical distribution of the two types of plural appears to be skewed with most morphological endings. This obviously must have a consequence also in terms of processing. Table 1 summarizes the data, providing three examples for every inflectional subclass: one for nouns, one for adjectives, and one for lexically ambiguous items².

TABLE 1.

Terminations	NOUN	Example	ADJECTIVE	Example	AMBIGUOUS	Example
-ci	715	basilico	3880	ciclico	582	amico
-chi	525	affresco	374	adunco	102	bianco
-ici	661	bonifico	3820	allergico	559	amico
-ichi	54	fico	24	antico	13	carico
-sci	2	falisco	2	falisco	2	falisco
-schi	102	affresco	266	brusco	41	etrusco
-gi	226	biologo	29	ematofago	16	antropofago
-ghi	215	ago	67	oblungo	40	casalingo
-logi	195	astrologo	0		0	
-loghi	38	apologo	3	analogo	1	omologo
-fagi	18	esofago	24	ematofago	11	antropofago
-faghi	2	sarcofago	1	polifago	1	polifago
-fugi	0		0		0	
-fughi	9	profugo	14	centrifugo	9	profugo

² Ambiguous items refer to items that figure both as noun and as adjective; thus, they are considered in the noun and adjective totals as well.

According to our main source (DISC), the items attested with both types of plural consist of 22 roots ending in voiceless velar and 32 roots ending in voiced velar (within the latter group, 22 are *-logo* compounds). Common examples are *farmaci/farmachi* 'drugs', *manici/manichi* 'handles', *monaci/monachi* 'monks', *stomaci/stomachi* 'stomachs', *intonaci/intonachi* 'plasters', *chirurgi/chirurgi* 'surgeons', *sarcofagi/sarcofagi* 'sarcophagi'.

It is worth noticing that, even though the general trends just depicted provide a realistic description of the plural formation's morphophonology for this particular kind of Italian words, other sources of data would no doubt yield slightly different figures. In fact, there is some disagreement among dictionaries with respect to a number of «critical» items, and this reflects the high degree of oscillation existing among native speakers for some of these words. One of the more critical subset is that of *-logo* pseudo-compounds (which is also characterised by high morphological productivity). Another source of unbalance derives from the uneven level of acceptance of some alternating forms. For instance, with *chirurgi/chirurgi* the former plural is almost universally accepted, while the latter is felt as marginal. By contrast, *farmaci* is definitely preferred to *farmachi*. In general, when two plural allomorphs exist, they seldom are of equal likelihood.

An informal experiment investigating the production of plural nonsense words, presenting velar-ending roots in the singular, is reported on in Dressler (1985). Each word was embedded in a sentence frame. Palatalization applied more frequently than velar retention in the plural formation of both nouns and adjectives, indicating that the two lexical classes behave similarly with respect to this morphophonological process. Interestingly, stress position turned out to be a relevant parameter, since palatalization applied in 90% of nonsense words with antepenultimate stress, but only in 56% of nonsense words with penultimate stress³. Moreover, words ending in *-ico* strongly favoured palatalization, especially when stressed on the antepenult (recall the high percentage of palatalizing words among the nouns and adjectives containing this morphological ending, as shown in Table 1).

The alternation between palatalizing vs. non-palatalizing words is also to be observed in verbal inflection, e.g. *le[g:]o-le[d:ʒ]i* 'I read, you read' vs. *pa[g]o-pa[g]i* 'I pay, you pay' (cf. also (1) above). In this case, however, a morphological regularity seems to be the ultimate source of the contrast (cf. Dressler 1985: 176). There is a strong tendency of verbs presenting palatalization to occur in different conjugation paradigms, as compared with verbs

³ As shown below, however, this prosodic factor turned out to be non-significant in our results.

without palatalization: cf. *le[d:ʒ]ere* 'to read' (II conjugation, with generalised palatalization before the thematic vowels [e]/[i]) vs. *pa[g]are* 'to pay' (I conjugation, with thematic vowel [a]). Note that Rohlfs (1966: 262) suggests that the thematic vowel /a/ promoted velar consonant retention in both verbal inflection and feminine plurals (see above).

2.2. Palatalization in Derivation

We saw above that the nominal suffix *-izia* from Lat. *-ĪTĪA* yields palatalization of the stem even if the velar consonant is retained in plural formation (e.g. *sporco-sporchi-sporcizia* 'dirty(SG., PL.)-dirtiness'). This is not always the case in derivational morphology; indeed, this behavior concerns the minority of cases.

With respect to the suffix *-izia*, there are just three words ending in *-cizia*, all mentioned above: *amicizia*, *sporcizia* and *pudicizia* (plus the prefixed forms: *inimicizia*, *impudicizia*). Among them, *amicizia* has palatalization in plural formation as well (*amici* 'friends'). There are no words ending in **-chizia*, **-gizia* or **-ghizia*. Consider now the verbal suffix *-icare*. According to our main source (DISC), it forms 8 verbs (plus their prefixed compounds), always involving palatalization: *appiccicare* 'to stick', *biascicare* 'to mumble', *ciancicare* 'to chatter', *luccicare* 'to shine', *moccicare* 'to drop (the nose)', *spiaccicare* 'to squash', *biancicare* 'to be white', *brancicare* 'to fumble'. Among them, however, only the latter two involve palatalization of an etymological velar consonant (*biancicare* coming from *bianco-bianchi* 'white' and *brancicare* from A.It. *brancare* 'to grasp'), while the palatal consonant is already present in the stem of the others. As a third example, consider the nominal suffix *-ità*. There are 220 nouns with palatalization (219 with voiceless, only 1 with voiced affricate), and only 1 noun with velar retention (*antichità* 'antiquity' from *antico-antichi* 'ancient'). Since velar retention in *antichità* follows from a diachronically different origin (< Lat. *ANTIQUĪTATĒM* with root-final labiovelar), we can exclude this case and state that the suffix *-ità* yields palatalization without exception. Note however that 215 out of the 220 words with palatalization have a palatal consonant in their base-form as well (e.g. *malvagio-malvagi-malvagità* 'wicked, wickedness', *semplice-semplici-semplicità* 'simple, simplicity'). Thus, the truly palatalising words in derivation are only five, namely: *caducità* 'transience' from *caduco-caduchi* 'transient', *opacità* 'opacity' from *opaco-opachi* 'opaque', *cecità* 'blindness' from *cieco-ciechi* 'blind', *parcità* 'parsimony' from *parco-parchi* 'parsimonious', and *mendicàtà* 'beggary' from *mendico-mendichi* 'beggar'. This leads us to the conclusion that palatalization,

with the above mentioned suffixes, is largely a matter of analogical pressure stemming from the vast majority of words with an etymological root-final palatal. Broadly speaking, it is hard to find truly palatalizing vs. non-palatalizing suffixes. Rather, what one mostly finds in derivation is consistency between inflected and derived form.

Dressler (1985) made a distinction among always palatalizing, frequently palatalizing and never palatalizing suffixes. For example, he noted that the suffix *-ìa* always causes palatalization, with the rare exception of Greek words like *monarchia* 'monarchy'. Similarly, he stated that the elative suffix *-issimo* always causes palatalization, with the only exception of *sporchissimo* 'very dirty'. Actually, more exceptions exist; see for example *naumachia* 'ship combat', *ce-liachia* 'kind of disease' for the first case, and *bianchissimo* 'bright white', *antichissimo* 'very ancient' for the second. As for elative formation, a more fruitful perspective would consist of taking the inflected form of each word as the source of the derived one. In fact, from the plurals of *sporco*, *bianco* and *antico* (i.e. *sporchi*, *bianchi* and *antichi*) one can predict velar retention in the elative form⁴. As for *-ìa* words, the regularity seems to be that all roots ending in a voiceless velar stop retain it (cf. 31 Greek pseudo-compounds with *-machia*, *-archia*, *-psichia*, *-achia* and *-trichia*, mostly philosophical or medical terms, plus *foschia* 'haze'); by contrast, all roots ending in a voiced velar stop show palatalization (cf. 650 Greek pseudo-compounds with *-logia*, *-fagia*, *-algia* and *-gogia*). Further examples of derivational suffixes could be cited, all leading to the same conclusions: namely, derivation is either coherent with inflection (cf. *-issimo*), or guided by some sort of morphophonological regularity (cf. *-ìa*).

Summing up, we may distinguish the following three cases:

(a) Suffixes, beginning with /i/, that always induce palatalization, i.e. *-izia*, *-ità*, *-icare*. As remarked above, however, palatalization actually applies to a very limited number of velar-ending roots, while in the majority of cases a palatal consonant is already present in the base-form. In addition, three inherited terminations beginning with /e/ induce palatalization, i.e. *-ense*, *-ente* and *-enza* (from Latin *-ĒNSEM*, *-ĒNTEM* and *-ĒNTIA*); cf. *circense* 'of the circus' alongside *circo-circhi* 'circus', *docente* 'teacher', *innocenza* 'innocence'. Composition through *-ĒNSEM*, *-ĒNTEM* and *-ĒNTIA* was highly productive in Latin, and no word ending in **-chense*, **-chente* or **-chenza* exists in Italian. This may provide an explanation for the fact that some recent creations also undergo palatalization: cf. *costaricense* 'people from Costa Rica' (on the

⁴ Although the elative form does not sound perfectly natural with all adjectives, there is a strong tendency to prefer the form with velar retention whenever the velar appears in the plural (e.g. *bieco-biechi/biechissimo* 'sullen, very sullen').

analogy with *uticense* from *Utica* 'island name').

(b) Suffixes that never induce palatalization. They all begin with /e/, as Dressler (1985) already noted (cf. *-eria*, *-etto*, *-esco*, *-ese* and *-essa* and *-eggiare*)⁵. Except for the three suffixes pointed out at point (a), a palatal consonant before /e/ is only possible when it belongs to the stem (cf. *braccetto* from *braccio-braccia*, 'arm(s)').

(c) Suffixes compatible with both palatalization and velar retention. These comprise the vast majority and may be divided in two categories: (1) Suffixes preserving the root-final consonant to be found in plural formation (i.e. *-ino/a*, *-issimo/a*, *-ismo*, *-ista*, *-izzare*)⁶; (2) Suffixes behaving differently in different morphophonological contexts (i.e. *-ia*).

3. EXPERIMENT

3.1. Materials

The experimental materials' choice was severely constrained by a number of factors. In particular, due to the various restrictions recapitulated in the preceding section, words involving derivational suffixes had to be excluded from our experiment, for their behavior is mostly predictable either out of the inflection of the base-form (plural formation), or out of the morphophonological sub-regularities applying to the specific derivational class they belong to. For similar reasons (morphological conditioning), verbal declension had to be neglected. In all such cases, palatalization could not be scrutinized independently of other factors.

The materials thus consisted of Italian nouns and adjectives, either with or without palatalization in plural formation. We could not oppose nouns and adjectives, since we did not want to group together items which turn out to be too similar from the phonotactic point of view and/or heavily influenced by some specific mor-

⁵ Cf. *poetico-poetici/poeticheria* 'poetic (SG./PL.), poetic action'; *amico-amici/amichetto* 'friend(s), little friend'; *mistico-mistici/misticheggiare* 'mystical (SG./PL.), to behave like a mystic'. A *prima facie* exception is represented by *diceria* 'rumour', showing palatalization before *-eria*. However, this word derives from Lat. DICĒRE 'to say' + *-ia*, rather than It. *di[k]- (< *dico* 'I say') + *-eria*. Thus, the palatal consonant stems from Late Latin word-internal palatalization.

⁶ Few exceptions have to be considered. Compare e.g. *forcina* instead of **forchina* from *forca* 'fork', *fisichino* instead of **fisicino* from *fisico-fisici* 'physic(s)'; *monachismo* instead of **monacismo* from *monaco-monaci* 'monk(s)'; *musicista* instead of **musichista* from *musica-musiche* 'music(s)'; *opacizzare* instead of **opachizzare* from *opaco-opachi* 'opaque(SG./PL.)'.

phophonological sub-regularity (recall that palatalizing adjectives almost exclusively belong to the highly biased *-ico* subclass). As a consequence, some ambiguous forms, pertaining to both lexical classes (e.g. *grafico* 'diagram' and 'graphic'), were also included. Note that in Dressler's experiment no fundamental difference emerged between pseudo-nouns and pseudo-adjectives.

We arrived at the final list by selecting the experimental items out of a much larger initial set. First, we excluded items that tolerate plural formation with and without palatalization, as in the examples mentioned above (cf. *chirurgo-chirurgi/chirurgi* 'surgeon(s)'). Second, we excluded words sharing specific morphological (and phonetic) features, due to the presence of the same suffixes. For this reason, nouns and adjectives ending in *-go/-gi* were excluded, as they all appeared to be composed with the highly biased *-logo* and *-fago* suffixes. As a consequence, we had to exclude the whole class of *-go/-ghi* words, for lack of a suitable contrasting set. We could thus only include roots ending in the voiceless velar. Third, since stress appeared to be an effective predictor in Dressler's experiment, we contrasted words stressed on the penult and on the antepenult. Fourth, we made an attempt at controlling word length. To this aim, we removed every dy- and pentasyllabic word. Finally, in order to control for the frequency factor, the initial set of candidates was submitted to a group of native speakers for subjective evaluation. Frequency judgements had to be expressed according to a five-point scale, with 1 = very rare, 5 = very frequent. Participants were asked to provide their judgements for both the singular and the plural form. Items that received a highly divergent score for the two forms were discarded.

The experimental classes are shown in the Appendix⁷. The two sets contrasting as to palatalization (jointly called the Velar class) comprised 16 nouns/adjectives distinguished for frequency (high vs. low), number of syllables (three vs. four), and stress position (penult vs. ante-penult). Stress position, however, could not be balanced between these two sets (with the palatalizing one only comprising words with ante-penult stress, and the non-palatalizing set comprising 13 words with penult and 3 words with ante-penult stress); moreover, the total number of trisyllables exceeded that of quadrisyllables. A third group of 32 nouns/adjectives, with roots ending in other consonants (henceforth: Non-Velar Class, see again the Appendix), was added in order to have a base-line for comparison, and also in order to counterbalance the stress profiles. The latter words were of course submitted to the same type of subjective frequency rating.

The 64 non-words required by the experimental design were obtained by modifying existing words in at most two consonantal phonemes. Two groups of 32 items each were created, one with items ending in *-co* in their singular form, the

⁷ For reasons of space, the Appendix is not reproduced here. The interested reader may consult it at the following address: <http://alphalinguistica.sns.it/QLL03.htm>

other with roots ending in other consonants. Moreover, 16 of the *-co* items presented palatalization in the plural, 16 did not. Thus, the distribution of root-final consonants, as well as the proportion of palatalizing and non-palatalizing items, was strictly balanced between words and non-words, so that participants could not rely on distributional factors in order to perform their lexical decision.

3.2. Method

The experiment consisted of a repetition priming task with visual lexical decision. Participants had to decide as fast as possible whether the stimulus appearing on a computer screen was a word or a non-word. They had to press one of two buttons, with the YES button placed on their preferred hand's side. The targets consisted of the base-forms (singular), while the primes consisted of the inflected (plural) or identical (singular) forms. The prime/target distance was 10 items in the average. The items were pseudorandomly presented, with three different randomizations in order to vary the presentation order across the participants subgroups. The final set was composed of 256 items, including both words and non-words (128 primes and 128 targets, with 64 identical and 64 inflected primes). Since each participant was supposed to respond only once to each target, we composed two balanced experimental lists, where the two types of primes were equally distributed. In the statistical analysis, we randomly grouped participants from each list, in order to obtain a single set of «superparticipants». The experimental conditions for the two lists are illustrated in Table 2.

TABLE 2. *Structure of the experiment (idealized illustration)*

LIST 1			LIST 2		
	<i>Prime</i>	<i>Target</i>		<i>Prime</i>	<i>Target</i>
<i>inflected</i>	drasti[tʃ]i	drasti[k]o	<i>identical</i>	drasti[k]o	drasti[k]o
<i>identical</i>	disti[k]o	disti[k]o	<i>inflected</i>	disti[tʃ]i	disti[k]o
<i>inflected</i>	alter[k]i	alter[k]o	<i>identical</i>	alter[k]o	alter[k]o
<i>identical</i>	cari[k]o	cari[k]o	<i>inflected</i>	cari[k]i	cari[k]o

The hardware consisted of a Mac computer and a Psycscope 1.2.5 button-box. Participants were provided with written instructions and were first introduced to a training session consisting of 8 stimuli, to familiarize with the experimental setting. The presentation of each stimulus was preceded by the appearance of an asterisk string in the middle of the screen (to facilitate the individuation of the fixation area), which remained visible for 500 ms before the actual stimulus appeared. This remained visible for 1000 ms; when a slower response was detected, a warning appeared, prompting the participant to speed up the responses. Each list had two

blocks of 128 items, separated by a short break.

The factors of the statistical design were the following: FUNCTION (Prime/Target), STATUS (Word/Non-Word), ROOT (Velar/Non-Velar), IDENTITY (Identical/Different, namely: singular vs. inflected), PALATALIZATION (Palatalizing/Non-Palatalizing), FREQUENCY (Frequent/Rare), STRESS (Penult/Antepenult), LENGTH (Trisyllable/Quadrisyllable). In the remainder of this paper, we shall conventionally use initial capitals whenever we refer to experimental factors or subsets of the experimental materials. Note further that since Targets invariably consisted of base-forms, the distinction «Identical» Targets vs. «Different» Targets merely refers to the different priming condition: the quotes are meant to remind the reader of this fundamental detail.

The statistical analyses were based on ANOVAs and post-hoc *t*-tests. Since each superparticipant (henceforth simply called «participant») performed the lexical decision on the whole experimental set, the by-participants analysis (F1) involved repeated measures ANOVAs, whereas the by-items analysis (F2) was based on univariate ANOVAs.

3.3. *Participants*

40 paid participants, all students at the University of Pisa, took part in the experiment. They were randomly assigned to one of the two lists, and to one of the three randomizations.

3.4. *Results*

First, we discarded the stimuli that were not correctly identified as words or non-words (9,0%). We also discarded correct target responses associated to missed primes (4,8%), for in such cases one can assume that the priming process has not been properly activated. In all (including words and non-words), we eliminated 13,8% of data points.

Among words, errors hit Rare more than Frequent (15% vs. 2,34%; $p = .000$ for both F1 and F2), Primes more than Targets (6,20% vs. 2,67%; $p = .000$ for both F1 and F2) and Different more than Identical (4,97% vs. 3,90%; $p < .05$ for both F1 and F2; within Primes alone: 6,78% vs. 5,63%; within Targets alone 3,16% vs. 2,17%). Interestingly, Palatalizing items were hit by errors less often than Non-Palatalizing ones (1,67% vs. 3,12%; $p = .000$ for F1, $p > .05$ per F2).

The following analysis will be mainly based on the RTs data, but we shall also provide subsidiary information concerning errors.

As a preliminary step, we inspected the individual participants' RTs and error rates. One participant was discarded due to unsatisfactory behavior on both errors and RTs, as measured in terms of distance from the mean values (threshold: the SD

multiplied by 2.5). Our statistical computations will thus be based on 19 participants.

The main effect of List turned out to be not far from significance ($F(1, 4125) = 3.439, p = .064$), with List 1 slightly faster than List 2. However, none of the interactions of this variable with the other main factors was significant, nor were the multiple interactions List x Function x Frequency x Identity x Root ($p = .695$), performed on the whole materials set, and List x Function x Frequency x Identity x Palatalization ($p = .881$), performed on the Velar subset⁸. In view of this overall lack of significance, we pooled both lists in the subsequent analyses.

The overall contrast Prime vs. Target (RTs: 654 ms vs. 592 ms; $F(1, 8384) = 747,547, p < .001$) was highly significant. Since the contrast Word vs. Non-Word was also highly significant (RTs: 653 ms vs. 586 ms; $F(1, 8384) = 728,551, p < .001$), in the remainder we shall only refer to the Word subset.

A highly reliable difference was observed in both types of analysis for the factors Frequency (Frequent vs. Rare: $F1(1,1820) = 136,666, p < .001$; $F2(1, 880) = 128,007, p < .001$) and Length (Trisyllable vs. Quadrisyllable: $F1(1, 18) = 76,804, p < .001$; $F2(1, 880) = 60.215, p < .001$). The latter factor, however, is hardly relevant, due to the restrictions imposed by the materials. The factors Root (Velar vs. Non-Velar: $F1(1, 18) = 5,373, p < .05$, $F2(1, 880) = 0,010, p > .05$) and Identity (Identical vs. Different: $F1(1, 18) = 5.211, p < .05$; $F2(1, 880) = 1.924, p > .05$) were only significant in the by-participants analysis. Finally, the factors Stress (Penult vs. Antepenult: $F1(1, 18) = 1.982, p > .05$, $F2(1, 880) = 0,005, p > .05$) and Palatalization (Palatalizing vs. Non-Palatalizing: $F1(1, 18) = 3.843, p > .05$, $F2(1, 880) = 0.039, p > .05$) were plainly non-significant. The above analyses, concerning the main factors, were however conducted on Primes and Targets together.

As for Primes alone, no significant effect or interaction was to be noted (but see below the Frequency data). Among Targets, the interaction Root x Identity turned out significant by participants and non-significant by items ($F1(1, 18) = 0,904, p < .05$; $F2(1, 438) = 0,450, p > .05$). In order to investigate in more detail this issue, we performed separate post-hoc analyses for the two subsets. As it happens, Non-Velar items, as opposed to Velar ones, exhibited a significant contrast between «Identical» and «Different» Targets by participants ($F1(1, 18) = 3.886, p < .050$) and a nearly significant contrast by items ($F2(1, 218) = 3.644, p = .056$; cf. table 3). Despite the diverging trend to be observed in the errors analysis (where the Identity contrast was significant for Velars as opposed to Non-Velars), this finding is of foremost importance, for it shows that the priming mechanism was statistically effective only among words presenting no morphophonological irregularity in plural formation. In other words, only in this case did the plural slow down the response to the base-form (i.e., the singular) as opposed to

⁸ The factors Stress and Syllable were excluded from this analysis, because they were not strictly balanced.

the Identical condition (where the base-form primed itself). By contrast, with words presenting the morphophonological irregularity here considered (i.e. the unpredictable palatalization among Velar words), no differential priming occurred among Targets ($F_1(1, 18) = 0.167, p > .05$; $F_2(1, 218) = 1.699, p > .05$).

TABLE 3. *Non-Velar items*

Primes 631	Identical	628,29	Frequent	576,29
			Rare	676,44
Targets 542,03	Different	633,81	Frequent	579,21
			Rare	686,14
	«Identical»	534,05	Frequent	514,65
			Rare	555,19
	«Different»	550,11	Frequent	530,51
			Rare	569,33

Let us finally consider the behavior of the Velar set (cf. table 4). The two-way interactions Function x Identity ($F_1(1, 18) = 6.119, p < .05$) and Palatalization x Identity ($F_1(1, 18) = 3.307, p < .05$) turned out to be significant by participants and non-significant by items. Even though the three-way interaction Function x Palatalization x Identity was non-significant ($F_1(1, 18) = 1.653, p > .05$), there was some ground for supposing that the factor Palatalization behaved differently in the Identical vs. Different condition, depending on whether the stimuli were Targets or Primes. Palatalization x Identity was non-significant with Primes in both analyses ($F_1(1, 18) = 0.109, p > .05$, $F_2(1, 221) = 0.358, p > .05$), but significant at least by participants with Targets ($F_1(1, 18) = 4.367, p = .051$). Post-hoc comparisons among Velar Targets showed that the contrast «Identical» vs. «Different» was significant by participants among Non-Palatalizing Targets ($F(1, 18) = 4.404, p = .05$; as for errors, $p = .048$) but non-significant among Palatalizing ones ($F(1, 18) = 1.842, p > .05$)⁹. We can thus conclude that the lack of differential priming to be found with Velar Targets was mostly due to Palatalizing items. For this class of words, it did not make any difference whether the activation of a Target (base-form) depended on an identical or a different (i.e., plural) Prime.

Next we checked for possible effects of the factor Frequency, again singling out the Velar subset. The three-way interaction Function x Palatalization x Frequency turned out to be significant by participants ($F_1(1, 18) = 4.440, p < .050$) but non-significant by items ($F_2(1, 434) = 1.440, p > .050$). The two-way interaction Frequency x Palatalization was separately analyzed for Primes and Targets.

⁹ This turned out to be the case for any of the three Randomizations used. The lack of statistical significance in the interaction Participants x Palatalization indicates that this trend generalized over the whole set of participants.

TABLE 4. *Velar items*

Primes 626,07	Palatalizing 623,09	Identical	616,44	Frequent	567,93	
		Different	629,68	Rare	665,69	
	Non-Palatalizing 628,80	Identical	621,93	Frequent	587,20	
		Different	636,24	Rare	664,69	
	Targets 541,28	Palatalizing 542,50	«Identical»	543,14	Frequent	527,76
			«Different»	541,86	Rare	556,06
Non-Palatalizing 540,08		«Identical»	534,11	Frequent	531,13	
		«Different»	546,05	Rare	550,44	
				Frequent	529,98	
				Rare	538,98	
				Frequent	527,79	
				Rare	564,97	

In the former case (Velar Primes, including both Palatalizing and Non-Palatalizing items), the interaction was marginally significant by participants ($F(1, 18) = 4.212, p = .055$) and non-significant by items, with Frequent Primes showing a significant Palatalizing vs. Non-Palatalizing contrast (577 vs. 601 ms; $F(1, 18) = 6.993, p < .05$; as for errors, $p = .008$) as opposed to Rare ones (665 vs. 656 ms; $F(1, 18) = 0.817, p > .05$; as for errors, $p = .044$). In the latter case (Velar Targets), neither Frequent items nor Rare ones showed any significant difference in the contrast Palatalizing vs. Non-Palatalizing, although in the errors analysis we found that F1 was significant ($p = .001$) among Rare items. The interaction Frequency x Identity turned out to be non-significant ($F(1, 18) = 0.784, p > .05$; $F(1, 212) = 0.921, p > .05$), thus suggesting that the difference between «Identical» and «Different» Targets did not vary with respect to the Frequency factor as far as the Velar class as a whole is concerned. Similarly, the three-way interaction Frequency x Identity x Palatalization, accounting for possible differences in Palatalizing vs. Non-Palatalizing Targets, did not show any significant effect either ($F(1, 18) = 0.995, p > .05$; $F(1, 212) = 0.284, p > .05$). We can thus conclude that Frequency did not affect the priming process of Velar items in any relevant manner, except that there was an overall facilitation for Frequent items, irrespective of the factor Palatalization¹⁰.

¹⁰ Although the overall comparison among the factor Root (Velar / Non-Velar) was not fully significant when Primes and Targets were jointly considered, a tendency towards significance emerged among both Frequent items ($F(1, 18) = 11.272, p < .005, F(1, 389)$

4. DISCUSSION

Our inquiry showed that the morphophonological process of palatalization leaves clearly identifiable traces in the Italian speakers' mental processing. In the following discussion, we shall refer to the three hypotheses listed in section 1.

A preliminary observation has to be put forth with respect to HYPOTHESIS 1, whose very formulation presupposes that the palatalization process be phonologically predictable. The analysis of the distributional data carried out in sect. 2 has, however, clearly shown that this is not the case in Italian. Palatalization has acquired the status of an irregular morphophonological process. It makes thus no sense in pursuing this hypothesis, which receives no support on either distributional or experimental ground (as shown by the significant difference observed between Velar vs. Non-Velar words). We shall therefore concentrate on the two alternative versions of HYPOTHESIS 2.

The first datum worth noting is that Velar and Non-Velar words (namely, words whose root ends or, respectively, does not end in a velar stop) behave differently, inasmuch as there is no reliable differential priming effect within Velar words, whereas an observable effect of this sort emerges with Non-Velar ones, where «Different» Targets presented a significant disadvantage as compared with «Identical» Targets. This shows that the absolutely regular Non-Velar plurals are most probably computed on-line, as opposed to the directly accessed Velar plurals. This lends clear support to HYPOTHESIS 2a, inasmuch as the latter words' unpredictable plurals (where the actual manifestation of the root-final consonant cannot be computed on the basis of any phonological evidence) prevents the speakers from exploiting an automatic, compositional strategy. This accounts for the lack of differential priming for «Identical» vs. «Different» Targets. It is worth stressing that the contrast between Velar and Non-Velar words was the only one, in the crucial subset of the statistical computations, to turn out significant in both types of analyses. We may thus conclude that Velar words are, so to say, diacritically marked in the mental lexicon,

= 4.151, $p < .05$) and, at least by participants, Rare ones ($F_1(1, 18) = 20.290$, $p < .000$; $F_2(1, 482) = 2.146$, $p > .05$). Note that, although both subsets showed a more or less significant contrast, the direction diverged dramatically, with Velar roots slower than Non-Velar ones among Frequent words and Non-Velar roots slower than Velar ones among Rare words, thus accounting for the overall non-significance. The non-significance of the interaction Root x Function in the two subsets (Frequent vs. Rare) demonstrates, however, that the above differences were not dependent on the Prime / Target contrast, indicating that this datum was a possible artifact of our lexical selection.

in accordance with the assumption that irregular morpho(phono)logical processes are less likely candidates to feed a compositional mechanism. Supposedly, the unpredictability of the plural formation process with Velar words has the consequence that the plural of each word belonging to this class is not only directly listed in the mental lexicon, but also strictly coarticulated with its corresponding singular. In other words, when reading the plurals *ami*[tʃ]i or *sara*[g]i (from *amico* and *sarago*), the speaker accesses at the same time both the plural form and the corresponding singular, so that any possible difference between the identical vs. different condition vanishes. Apparently, in the mental lexicon of the Italian speakers, these irregular plurals have no independent existence with respect to their base-form (i.e., the singular)¹¹.

Note, however, that although we gathered clear evidence that Velar plurals are directly accessed, this does not exclude the possible existence of alternative processing routes. Indeed, the relatively frequent occurrence of speech errors of the relevant type (possibly supported by the marginal existence of double-plural words, as indicated in sect. 2.1) proves that the speakers can at any moment activate the analogical path, or possibly the regular mechanism of plural formation, consisting of changing the final vowel in a fairly predictable way¹². This provides clear support to double-route models, as opposed to single-route ones.

Although HYPOTHESIS 2a received the strongest support in our experiment, some (admittedly weak) support emerged also in favor of HYPOTHESIS 2b, for a slight differential priming contrast emerged with Non-Palatalizing as opposed to Palatalizing targets, although only by participants. Furthermore, it should be pointed out that Palatalizing words showed the tendency to be less often hit by errors than Non-Palatalizing ones (1,67% vs. 3,12%), both among Frequent items (0,53% vs. 1,23%) and among Rare ones (2,81% vs. 5,01%). It is fair to say, however, that this datum might conceal a possible bias in our materials. As shown in the Appendix (see fn. 7), all but one of the Palatalizing words ended with the unstressed suffix *-ico*, while only 3 out of 16 among non-Palatalizing ones presented this feature (besides 4 words end-

¹¹ On the other hand, one may reasonably assume that this relation is not bidirectional, for the singular of such words does not evoke the plural with equal strength.

¹² The two authors have collected speech errors such as **reciprochi*, **ipocondriachi*, **rammarici* (for *reciproci*, *ipocondriaci*, *rammarichi*) uttered by cultivated people in formal contexts, such as lectures or conference presentations. While the first two examples are compatible with a default rule activation for plural formation, the third may only be explained on the basis of analogical attraction. One thus cannot exclude that the analogical interpretation is involved in the former cases as well.

ing with stressed *-ico*). Now, given the strong tendency of words ending with unstressed *-ico* to present a palatalizing plural, one cannot exclude that the slight difference observed between Palatalizing and Non-Palatalizing items could be due to a sort of «lexical gang» effect induced by this particular suffix. As a matter of fact, the Palatalizing vs. Non-Palatalizing contrast turned out to be marginally significant among Frequent Primes as opposed to Rare ones, possibly reflecting the fact that no word ending with unstressed *-ico* was comprised among Frequent Non-Palatalizing words. On the contrary, no such difference emerged between Palatalizing vs. Non-Palatalizing Rare Primes, where 3 (out of 8) words ending with unstressed *-ico* were present, although this lack of difference may possibly depend on a sort of ceiling-effect yielded by the longer latency necessary to perform the lexical decision with Rare items. Admittedly, this casts some doubt as to the real validity of the evidence in favor of HYPOTHESIS 2b.

Further ground for casting doubt on the strength of HYPOTHESIS 2b stems from a possible, and unavoidable, orthographical bias in our materials. As it happens, Non-Palatalizing words present the graphematic sequence <ch> (corresponding to the phoneme /k/), which adds one character to Non-Palatalizing plurals as opposed to Palatalizing ones, where the plural is marked by the single grapheme <c> (phonemically /tʃ/). One might reasonably suppose that Non-Palatalizing plurals took slightly longer to be recognized. Note that, this being the case, the obvious consequence can only be that the latter words' differential priming effect was presumably enhanced. It follows, then, that the slight difference between Palatalizing and Non-Palatalizing Targets might ultimately be artifactual. On the other hand, the fact that the only set of words where the priming effect turned out to be statistically fully reliable was the Non-Velar set (where the sequence <ch> did not occur) shows that this orthographical bias did not pollute our results.

There is an additional caveat, connected with the phonotactic nature of our materials, that we need discussing. One might in fact raise the objection that the Velar vs. Non-Velar classes diverged dramatically as far as the final part of the word is concerned. While the root-final consonant of Velar items was either [k] (always in the singulars, half of the times in the plurals) or [tʃ] (in the remaining half of the plurals), the equivalent consonant(s) of Non-Velar items could be any out of the following consonants or biconsonantal clusters: [d l n: ns nt nts p r rn rt s st t]. Moreover, the penultimate vowel in the Velar class was often [i], whereas no such homogeneity was to be observed in the Non-Velar class (see the Appen-

dix (see fn. 7)). One might thus suggest that the Velar class gave rise to a sort of «rhyme effect», with the consequence that RTs were artifactually speeded up by a purely phonotactic type of priming. Although a list effect of this sort cannot be excluded, it is nevertheless worth underlining that Non-Words were constructed exactly in the same way as Words, so that an almost identical amount of Velar Non-Words presented the same type of «rhyme» as Velar Words. In fact, the items ending with stressed or unstressed *-(i)co* were 22 among Velar Words and 19 among Velar Non-Words. Thus, since both Words and Non-Words presented the same sort of phonotactic bias, it is unlikely that our participants could develop a specific strategy with respect to Velar items, to the effect that the latter could be recognized as words faster than Non-Velar items.

In any case, in order to check whether the responses to Velar words, as opposed to Non-Velar ones, were possibly speeded up by the unnatural proportion of the *-(i)co* termination («rhyme effect»), we carried out a series of control analyses among Word Targets, with respect to the RT difference between the first vs. the second half of the experimental list. The logic of this is the following. As is usually the case in lexical decision tasks, participants are expected to respond faster, due to acquired experience, on the second half of the list than on the first one. Thus, if there were any advantage for one of our experimental subsets, this should have emerged in terms of differential acceleration in task performance. Here is what we found. There was indeed a difference between the first vs. the second half of the list for each of the three Randomizations¹³, and this effect was found for both Velar ($F_1(1, 18) = 11.124$, $p < .005$; $F_2(1, 108) = 24.766$, $p < .005$) and Non-Velar Targets ($F_1(1, 18) = 9.245$, $p < .005$; $F_2(1, 108) = 16.836$, $p < .005$). Crucially for our purpose, this effect was also found for Palatalizing ($F_1(1, 18) = 15.736$, $p < .005$; $F_2(1, 108) = 23.575$, $p < .001$) and Non-Palatalizing Targets ($F_1(1, 18) = 4.124$, $p < .05$; $F_2(1, 108) = 6.909$, $p < .05$). Thus, the effect appeared to be homogeneously distributed within all experimental subsets. In addition, we verified with Velar Targets whether the contrast «Identical» vs. «Different» (including both Palatalizing and Non-Palatalizing ones) varied in the first vs. the second half of the list, with respect to the three Randomizations. What we found was that the lack of differential priming effect

¹³ First Randomization: 564 ms vs. 542 ms, $F_1(1,18) = 6.987$ $p < .01$; $F_2(1, 217) = 12.145$, $p < .001$; second Randomization 553 ms vs. 536 ms, $F_1(1, 18) = 5.245$, $p < .05$; $F_2(1, 217) = 9.856$, $p < .001$; third Randomization 545 ms vs. 524 ms, $F_1(1, 18) = 7.476$, $p < .01$; $F_2(1, 217) = 8.965$, $p < .01$

on Velar Targets was uniformly distributed¹⁴. We may thus safely conclude that Velar Targets did not suffer from any «rhyme effect».

As a final caveat, one might observe that although the factor Stress did not yield a statistically significant effect, the interpretation of this datum is obscured by the fact that, as shown in the Appendix (see fn. 7), a sharp contrast existed between the Palatalizing and the Non-Palatalizing sets. The former items were all stressed on the antepenult, while the latter ones were predominantly stressed on the penult. This asymmetry was of course due, as remarked in sect. 4.1, to the severe constraints imposed by the Italian lexicon. Consequently, although our experiment proved that the factor Stress did not matter in general, i.e. within the whole set of Words (considering both Velar and Non-Velar items), we cannot exclude that this prosodic shape unbalance concealed a latent difference between Palatalizing and Non-Palatalizing Words that would otherwise have emerged, as it did in Dressler's (1985) elicitation experiment. Nevertheless, given the total lack of significance of the factor Stress, one might reasonably claim that such possible difference is unlikely to be a major one.

Summing up, our data suggest that the main effect consisted of the contrast between Velar and Non-Velar words. The difference is obviously due to the unpredictable behavior of Palatalizing words, namely to the irregular nature of the morphophonological process involved. This in turn implies the unpredictable behavior of the whole class of Velar words, which is reflected in the absence of differential priming. We interpret this as evidence of direct access.

5. COMPARISON WITH PREVIOUS RESULTS

Although the situation sounds quite plausible and appealing, one problem suggests itself on comparative grounds. In a companion research, concerning the behavior of Bulgarian words with vs. without «vowel / zero» alternation, Bertinetto and Jetchev (in press) found that alternating and non-alternating words differ sharply between themselves, for the former but

¹⁴ First Randomization's RTs: 555 vs. 557 ms in the list's first half, $F_1(1, 18) = 0.123$, $p > .05$; $F_2(1, 108) = 1.809$, $p > .05$ and 542 vs. 537 ms in the second half, $F_1(1, 18) = 1.154$, $p > .05$; $F_2(1, 108) = 0.321$, $p > .05$. Second Randomization's RTs: 544 vs. 562 ms in the first half, $F_1(1, 18) = 1.707$, $p > .05$; $F_2(1, 108) = 0.196$, $p > .05$ and 525 vs. 530 ms in the second half, $F_1(1, 18) = 2.021$, $p > .05$; $F_2(1, 108) = 1.409$, $p > .05$. Third Randomization's RTs: 537 vs. 545 ms in the first half, $F_1(1, 18) = 1.501$, $p > .05$; $F_2(1, 108) = 1.386$, $p > .05$ and 524 vs. 530 ms in the second half, $F_1(1, 18) = 0.924$, $p > .05$; $F_2(1, 108) = 1.209$, $p > .05$.

not the latter exhibit a clear differential priming effect. The prerequisite for alternation, in Contemporary Bulgarian, consists of the presence of the appropriate vowel within the root (actually towards the end of it). Considered together, the results of the two parallel studies might appear somewhat surprising for the following reasons. First, in Bulgarian Bertinetto and Jetchev found a contrast, in terms of differential priming, between morphotactically opaque (alternating) vs. transparent (non-alternating) words, whereas no statistically reliable difference emerged in the equivalent Italian case, namely in the opposition palatalizing vs. non-palatalizing items. Second, the differential priming effect was observed in Bulgarian with the morphotactically most complicated words (the alternating ones), whereas this effect emerged in Italian precisely with the most transparent items (non-velar words), namely those immune from the palatalization process.

This seeming contradiction is most probably explained by the different situation in the two languages. All the Bulgarian words on which the Bertinetto and Jetchev's priming experiments were based ended with one (occasionally two) consonant(s), so that base-form and root coincided. In order to generate the plural or the derived noun from the base, the appropriate suffix was simply added to the root, whether or not the «vowel / zero» alternation process occurred. Consider, for instance, the following examples: *mebel* / *mebeli* 'piece(s) of furniture' (non-alternating), *fakel* / *fakli* 'torch(es)' (alternating). This is not invariably the case, because a number of Bulgarian words present a base ending with a vowel, which is replaced by another vowel in the plural (e.g., *lice* vs. *lica* 'face(s)', both stressed on the last syllable). Nevertheless, consonant-final words like the ones utilized in the cited study largely prevail in the Bulgarian lexicon, and this makes up a striking difference with respect to Italian, where consonant-final words are very rare, specially in the inherited lexicon. What one normally finds, instead, are vowel-final words which replace the last vowel in the appropriate way in both inflection and derivation (e.g., *tavolo* / *tavoli* 'table(s)' / *tavolata* 'large laid table'; *casa* / *case* 'house(s)' / *casata* 'lineage'). This implies that the Italian words' base-form almost never coincides with the root, whereas this frequently occurs in Bulgarian and (most notably) systematically occurred in the mentioned study.

Now consider what happens when an inflected or derived form is spotted by the participants to a priming experiment like the ones described here or in Bertinetto and Jetchev (in press). In the case of consonant-final Bulgarian items, provided no morphophonological complication is involved, participants necessarily access the word's root even when reading a morphologically

modified form. The root's activation level is raised just as it would be if the base itself were presented. No differential priming (between «identical» and «different» targets) is thus to be expected with fully regular and transparent words, like the non-alternating ones. By contrast, with morphophonologically opaque words, no full activation of the root is to be expected, so that a differential priming effect should emerge, for different primes could not possibly activate the base to the same extent as identical primes do. This is exactly what Bertinetto and Jetchev obtained in their two experiments.

Interestingly, a similar situation occurs in German, according to the plural formation's experimental study by Sonnenstuhl-Henning (2003). The different plural endings yielded contrasting results in terms of differential priming effect. The *-s* plural as well as the predictable *-n* plural of feminine nouns did not cause any differential priming, whereas the *-er* plural and the irregular *-n* plural of non-feminine nouns brought about a noticeable differential priming. Apparently, the lack of differential priming seems to occur when the following two conditions simultaneously apply: (i) coincidence between root and base-form; (ii) full predictability of the morphological process. This is the situation that we find in Bulgarian. On the other hand, words like *Dorn / Dornen* 'thorn(s)' only share condition (i), and thus present the differential priming effect.

Turning now to Italian, we find a very different condition. When the participants to our study saw the different primes of transparent words (e.g., *tavoli* 'tables'), they obviously saw the root (*tavol-*) but not the corresponding base-form (*tavolo*). It is thus unsurprising that our Different and Identical Primes had a different impact on the Targets, for these consisted of the base-form of the relevant words, rather than of the root¹⁵.

One might object that the proposed explanation does not account for the datum that Italian Palatalizing vs. Non-Palatalizing words did not substantially differ between themselves, despite the obvious fact that the latter words, in contrast to the former, are morphotactically transparent just like

¹⁵ Our results do not allow us to choose between the two possible alternatives relating to how Italian words are stored in the mental lexicon, namely as base-forms or as bare roots. In both cases we would expect the observed differential priming effect, when participants see the base-form after preactivation by means of a morphologically related prime. In the first alternative, the speaker would need time to recover the base once the root has been activated, since the latter is only a fragment of the former. In the second case, the speaker would need time to generate the correct word-form, by matching the activated root with the one contained in the visually presented word. By this we do not mean that these two alternatives cannot be singled out. But in order to do this, one should design the relevant tests.

the Non-Velar words. One might thus expect that they should behave like the Non-Velar items. This is not necessarily the case, however, for at least two reasons. First, the plural of non-palatalizing words is unpredictable just like the plural of the palatalizing words, since no synchronic rule generates all and only the appropriate forms¹⁶. Second, the structure-preserving character of the non-palatalizing words' roots is only to be observed at the phonological, not at the graphematic level. As noted above, non-palatalizing words add the grapheme <h> after <c> in their morphologically modified forms, to convey the information that the velar pronunciation is preserved despite the presence of /i/ at the beginning of the inflectional or derivational suffix (compare the plural *amici* [a'mitʃi] 'friends' with the plural *fuchi* ['fuki] 'drones'). This is ostensibly different from what one observes with non-velar words, where nothing else occurs than the mere substitution of the desinence vowel (*tavolo* / *tavoli*). Since our participants yielded so strikingly different results for Non-Velar vs. (Velar-)Non-Palatalizing words, one may assume that, for Italian speakers, velar words (including both palatalizing and non-palatalizing ones) constitute a fairly peculiar lexical set, available for direct access not only in the base-form but also in their morphologically modified forms (inflected and/or derived, as appropriate). By contrast, the morphologically modified forms of non-velar words are accessed through the activation of a suitable mechanism, leaving detectable traces in terms of decision time. There would be no real advantage in directly accessing these forms, specially considering that they make up the great majority of the whole lexicon.

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¹⁶ Jarema, Feldman and Perlak (2004), in a cross-modal experiment relating to Polish palatalization, obtained apparently diverging results. Polish, however, as opposed to Italian, is a language where the palatalization process seems to be fully regular, as explicitly observed by these authors. One and the same word (provided the relevant root-final consonant occurs) presents palatalization before specific case-endings, while preserving the root-final consonant before other case-endings. In addition, some words may exhibit a vowel alternation phenomenon. Jarema, Feldman and Perlak (2004) showed that the latter words do not differ significantly from the former and that, for one and the same word, palatalizing forms do not differ from non-palatalizing ones.

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SUMMARY: Lo scopo dell'esperimento era di raffrontare il comportamento delle parole italiane con vs. senza palatalizzazione. Le forme con palatalizzazione si possono tipicamente osservare nel plurale di nomi ed aggettivi con radici che terminano in velare (da intendersi, qui, come «occlusiva velare»). Tuttavia, non tutte le parole di questo tipo presentano la palatalizzazione, poiché il processo fonetico che sta all'origine del fenomeno non è più attivo. La prima parte dello studio descrive l'attuale distribuzione in flessione e derivazione, mostrando che la palatalizzazione è imprevedibile, fatta eccezione per talune regolarità morfo(fono)logiche. I materiali utilizzabili nell'esperimento di *priming* ripetuto sono stati condizionati da vari fattori, e sono costituiti in due insiemi di nomi ed aggettivi controllati per frequenza: Velari (ulteriormente suddivisi in Palatalizzanti e Non-Palatalizzanti) e Non-Velari (con radici non terminanti in velare). I risultati indicano che le parole Non-Velari sono recuperate mediante una strategia compositiva, mentre le parole Velari, tanto Palatalizzanti quanto Non-Palatalizzanti, sono verosimilmente recuperate per via diretta.