The diachronic evolution of syllable-onset /Cl/ clusters in Romance revisited

An integrated account

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This paper deals with the historical development of the syllable-onset clusters /kl gl pl bl fl/ in Romance languages and dialects and with their articulatory and/or perceptual motivations. Several diachronic pathways are identified which depart from articulatory unstable [Cʎ] sequences, most distinctively lateral vocalization (e.g., [kʎ] > [kj]) and obstruent lenition (e.g., [kʎ] > [çʎ]). Most sound changes are attributed to articulatory variation insofar as they require adjustments in constriction degree and location. In a few cases the replacement of one consonantal sound by another appears to have been induced by acoustic-perceptual equivalence, as for example the substitution of [θ] by [f] in Franco-Provençal and of palatalized labial stops by palatal stops in southern Italy. Of special interest is the one-to-many derivation problem by which a given phonetic outcome may be achieved through more than one pathway as exemplified by the two phonetic developments /kl/ > [kʎ] > [kj] > [c] > [tʃ] > [ʃ] and /kl/ > [kʎ] > [çʎ] > [çj] > [ʃj] > [ʃ].

Keywords: syllable-onset liquid clusters, gestural blending, stop lenition, glide reinforcement, Romance languages

1. Introduction

This study concerns the phonetic pathways involved in the historical development in Romance of the syllable-onset clusters /kl gl pl bl fl/ to be found in words derived from CLAVE 'key', GLACIE 'ice', PLANTA 'plant', BLANCU 'white' and

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FLAMMA 'flame'.[1] A great variety of phonetic end products is motivated by the fact that the obstruent C1 and the alveolar lateral C2, which appears to have been replaced by the alveolopalatal [ʎ] since a very early age, may both undergo separate changes and interact in complex ways. The phonetic material under analysis covers most language domains where those clusters have undergone significant sound changes, essentially French, Franco-Provençal and Occitan (which will often be referred to as part of the Galloromance language group), Romanian, the dialects of Italy and also Galician, Portuguese, Spanish and Asturian in the Iberian Peninsula. In view of the rich array of diachronic developments under consideration, this research topic has had a great deal of attention in the literature. Among the monographic studies which have dealt with the diachronic developments in question I should mention the general survey Repetti and Tuttle (1987) as well as de Guer (1899), Haberli (1908) and Tuttle (1975) and Barbato (2005) on Norman French, Franco-Provençal and Italo-Romance, respectively. The present paper proposes phonetic explanations for the relevant phonetic pathways and individual sound changes, which often differ from those advocated in these and other earlier studies on the subject.

It is widely agreed among Romanicists (see Lausberg 1963 and other works cited in this paper) that the general scenario is for the alveolar lateral /l/[2] of the syllable-onset clusters of interest to shift to the voiced alveolopalatal lateral [ʎ] in the first place and for the outcome [ʎ] to change to [j] at a later time, which may explain the presence in a number of the dialect zones under study of lexical forms with both sequences [Cʎ] and [Cj], such as for example [kʎaw]/[kjaw] CLAVE, [gʎas]/[gjas] GLACIE, ['pʎanta]/['pjanta] PLANTA, [bʎaŋ]/[bjaŋ] BLANCU and ['fʎama]/['fjama] FLAMMA in Ribagorçan Catalan. Some information about the articulation of [ʎ] *vis-à-vis* other palatal consonants is in order. Based on articulatory data from the world's languages (Recasens 2013), [ʎ] should be considered an alveolopalatal consonant, which may also be produced exclusively at the alveolar zone but not at the palatal zone, and allows airflow out of the vocal tract through the sides of the mouth. With regard to other consonants also referred to in this paper, [ʎ] differs from [c]/[ɟ] (stops), [ç]/[ʝ] (fricatives) and [j] (approximant), which are (alveolo)palatal and thus produced by means of an alveolopalatal or palatal closure or constriction, and from the fricatives [ʃ] and

1. Capitalized Latin etyma are often added to the phonetic forms mentioned throughout the study, which correspond to their orthographic version in Classical Latin. In these etyma I followed by a vowel corresponds to [j] (e.g., GLACIE 'ice') and geminates are represented by double consonants (e.g., FLAMMA 'flame').

2. In the present study etymological vowels and consonants are enclosed in slashes and the sound change end products are enclosed in square brackets.

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[ʒ] and affricates [tʃ] and [dʒ], which are palatoalveolar. The conflicting production requirements involved in anticipating the formation of a central lingual constriction and of lateral oral openings for [ʎ] during the preceding stop or fricative account for many sound changes which have operated on the five clusters under study.

Therefore, it does not seem to be the case that the alveolar lateral of the consonant clusters under consideration has been replaced directly by the palatal glide because the two segments [l] and [j] are acoustically equivalent, and thus that a form like Tuscan Italian ['kjave] has been issued directly from ['klave] CLAVE. The acoustic equivalence hypothesis proposed originally by von Essen (1964) and revisited by Ohala (1981) claims that a clear, and thus non-velarized or non-pharyngealized, variety of /l/ whose production involves a relatively high and front tongue body position may be categorized perceptually as /j/ in so far as these two consonants share an acute acoustic spectrum endowed with a second formant (F2) frequency at about 1800–2000 Hz.[3] As pointed out in the following sections, while a clear variety of /l/ should certainly be posited to begin with,[4] both the cooccurrence of lexical forms in which etymological /kl/ is implemented as [kl], [kʎ] and [kj] in given French and Franco-Provençal dialects and the end products [ʎ] of /gl/ in Galloromance and C./S. Italy and [ʎ]/[j] of /bl fl/ in S. Italy support the existence of a common source [Cʎ] for the syllable-onset clusters /kl gl pl bl fl/ in all these language domains.

A difficult issue is the phonetic motivation for the replacement of clear /l/ by [ʎ] in these consonant clusters. Two explanatory hypotheses may be proposed in this respect, which are based largely on the fact that, as discussed later in the present study, /l/ palatalization has taken place after velars rather than after bilabials and labiodentals. According to an articulation-based hypothesis, through a gestural blending mechanism operating on /kl/ and /gl/ (see Browman & Goldstein 1989, 1991 on this concept), the velar stop would have been fronted from velar to palatal or alveolopalatal and the alveolar lateral would have become [ʎ] by enlarging their degree of tongue contact towards the center of the palatal zone, the final phonetic outcome being a compromise sequence of two consonants exhibit-

3. In view of the absence of intermediate lexical forms with [Cʎ], a direct change from /Cl/ to [Cj], which would support the acoustic equivalence interpretation, appears to be needed in order to handle the forms [pjak], [pcak], [ptʃak] and [tʃak] derived from /plak/ 'old man' in Gheg Albanian and [pjaa], [tʃaa] derived from Siamese /plaa/ 'fish' in Tai dialects (Thomason 1986; Li 1977: 85).

4. It is assumed that in order to change to [ʎ] in the onset clusters under analysis /l/ must have been relatively clear in Proto-Romance. Evidence for this variety of /l/ may already be found in Latin where the alveolar lateral has been reported to be clearer in syllable-onset position than syllable-finally (Sen & Zair 2022).

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ing a single closure location all throughout which may be transcribed as [cʎ]. A crucial condition for this gestural blending process to apply is for /l/ to be clear (non-velarized) instead of dark (velarized or pharyngealized) and thus to exhibit a fronted and relatively raised tongue body position; indeed, in velar + /l/ sequences with dark /l/, the lingual configuration for the lateral is likely to cause the dorsal closure for the velar stop to be formed at the soft palate rather than at the hard palate or at the alveolopalatal zone. According to an alternative explanation proposed by Müller (2011), the sequence /kl/ is capable of generating some frication presumably through an imperfect dorsovelar closure during the stop induced by the anticipation of the lateral gesture, which may extend into the closing period of /l/ and lead to its categorization as /ʎ/ by listeners. Air leakage is likely to take place during the velar stop in this and other contextual conditions since a dorsal closure which is being formed at the smooth soft palate surface is often incomplete. Regarding the relationship between the alveolopalatal lateral [ʎ] and frication, note that it became [ʒ] word-medial intervocalically before yielding [x] through the voiceless equivalent [ʃ] in Old Spanish (e.g., ['oʎo] OCULU 'eye' > ['oʒo] > ['oʃo] > ['oxo]) and that it may change to [j], [ʒ] and even [ʃ] in present-day Argentinian Spanish (e.g., ['kaʒe], ['kaʃe] for /káʎe/ *calle* 'street'; Malmberg 1950).

A major goal of the present investigation is to establish the diachronic pathways for the syllable-onset clusters /kl gl pl bl fl/ in Romance and to determine whether the sound changes which have taken place along those pathways are better explained in articulatory/aerodynamic or acoustico-perceptual terms. In the former event (as in the case of the major replacement of [Cl] by [Cʎ] discussed above), those sound changes would have been induced by context-dependent variations in articulation, which in the long run would have given rise to new segment types through the perceptual misidentification of one sound by another. An example of a production-based phonetic pathway is the identification of a fronted realization of /k/ before a front vocoid as [c] and of the (alveolo)palatal stop by [tʃ] at a later stage (Italian ['tʃɛnto] CENTU 'one hundred'). If associated with acoustic equivalence, on the other hand, the substitution of a consonantal realization by another one would be determined by acoustic similarity without changes in articulation being necessarily present, as could be the case for the categorization of a clear variety of /l/ as /j/ referred to above.

Another relevant theoretical issue to be addressed in this paper is the one-to-many derivation problem, namely, the existence of cases where a given phonetic outcome may be achieved through more than one diachronic pathway. Thus, for example, as argued in §3.2, the change /gl/ > [dʒ] may have proceeded through the two quite different developments /gl/ > [gʎ] > [gj] > [ɟ] > [dʒ] and /gl/ > [gʎ] > [ɣʎ] > [ʎ] > [ɟ] > [dʒ], which diverge from one another at the initial stages in that

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[gʎ] becomes [gj] through /l/ vocalization in one pathway and [ɣʎ] through stop lenition into an approximant in the other pathway. One way to ascertain whether one or both phonetic developments are likely to have been at work in specific Romance languages or dialects is by evaluating the adequacy of the intermediate sound changes based on their phonetic plausibility and on their availability in other Romance-speaking domains.

The present study is organized as follows. Section 2 discusses methodology and §3, §4 and §5 deal with the reconstruction of the diachronic pathways for the syllable-onset clusters /kl gl pl bl fl/ in the word-initial and word-medial intervocalic positions. Data for these consonant clusters after a heterosyllabic consonant, as for example etymological /mpl/ in the case of the Spanish word [in'ʧaɾ] IMPLERE 'to swell', will be referred to occasionally. Section 6 recapitulates and evaluates the main findings reported in the three preceding sections.

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2. Methodology

The phonetic analysis carried out in the present investigation is based on the phonetic end products for /kl gl pl bl fl/ in 45 dialect regions taken from the bibliographical sources mentioned in the Appendix. Figures 1a/b through 5a/b provide these phonetic realizations grouped by manner of articulation (stop, affricate, fricative, sonorant) separately for each consonant cluster and word position. Cells filled in gray indicate that a given phonetic realization occurs in a given dialect. The Romance languages and dialects appearing in the figures are as follows:

- (French) Angevin, Berrichon, Bourguignon, Champenois, Franc-Comtois, Gallo, Lorrain, Normand, Poitevin/Santongeais.
- (Franco-Provençal) Bressan, Dauphinois, Forézien, Fribourgeois, Génevois, Jurassien, Lyonnais, Neuchâtelois, Savoyard, Valaisan, Valdôtain, Vaudois.
- (Occitan) Auvergnat, Limousin, Provençal/Vivaro-Alpin.
- (Italy) (Northern) Piedmontese, Lombard, Emiliano-Romagnol, Ligurian. (Central) Tuscan, Marchigiano, Laziale. (Southern) Abruzzese, Molisan, Campanian, Calabrian, Lucanian, Apulian, Sicilian.
- (Iberian peninsula) Spanish, Asturian, Ribagorçan Catalan, Galician, Portuguese.
- (Romanian) Dacoromanian, Aromanian.

Those language domains where the five consonant clusters have undergone a limited number of changes have not been included in the figures but will be referred to in the body of the text. This is the case for Sassarese, Gallurese and Corsican, and also for Standard French, Lenguadocian Occitan, Catalan and Rhaetoro-

mance where /l/ palatalization has operated only on intervocalic /kl/ and /gl/ (Catalan [uʎ] OCULU 'eye' and ['reʎə] REGULA 'rule' but [kla] CLARU 'clear' and [gla] GLANDE 'acorn').

Reconstructed diachronic pathways are presented only for the word-initial clusters in tables placed at the beginning of each section. Thus, for example, Table 1 shows all phonetic end products for word-initial /kl/ across Romance dialects. In this and the following tables, consonant realizations separated by commas stand for different phonetic outcomes issued from a common source. Needless to say, while elaborated using real dialect data, their adequacy remains hypothetical in some cases.

Mention needs to be made of the use of the phonetic symbols [c] and [ɟ], which often alternate with [kj] and [gj] and may be considered articulatory variants of the phonemic sequences /kj/ and /gj/ in Galloromance and of /c/ and /ɟ/ proper in S. Italy. Another relevant aspect is that whenever occurring in the word-medial intervocalic position the /Cl/ clusters of interest were either available in Classical Latin (e.g., Catalan ['dob:lə] DUPLU 'double') or else emerged through vowel syncope in Late Latin or Early Romance (e.g., Catalan [u'rɛʎə] AURIC(U)LA 'ear', Fribourgeois ['viʎo] VECLU < VET(U)LU 'old, masc. sing.').

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3. Velar consonant clusters

3.1 Word-initial /kl/

Table 1. Diachronic pathways for word-initial /kl/

/kl/	> kʎ, cʎ	> kj	> c(j)	> tʃ	> ʃ
		> çʎ	> ç(j)	> ʃ(j), s(j)	
				> θ(j)	> f
			> θʎ	> θ	> f
			> ʎ	> j	

Table 1 shows the diachronic pathways for word-initial /kl/ in the Romance languages and dialects under study. While the sequence [kʎ] is not available everywhere in Romance (see Figure 1a), we assume that it is the common source from which other phonetic outcomes derive (see §1). The phonetic realizations included in the figure appear to have proceeded through two major pathways, which happen to depart from the vocalization of the alveolopalatal lateral into [j],

i.e., [kʎ] > [kj] (§3.1.1) and the lenition of the velar stop into [ç], i.e., [kʎ] > [çʎ] (§3.1.2).

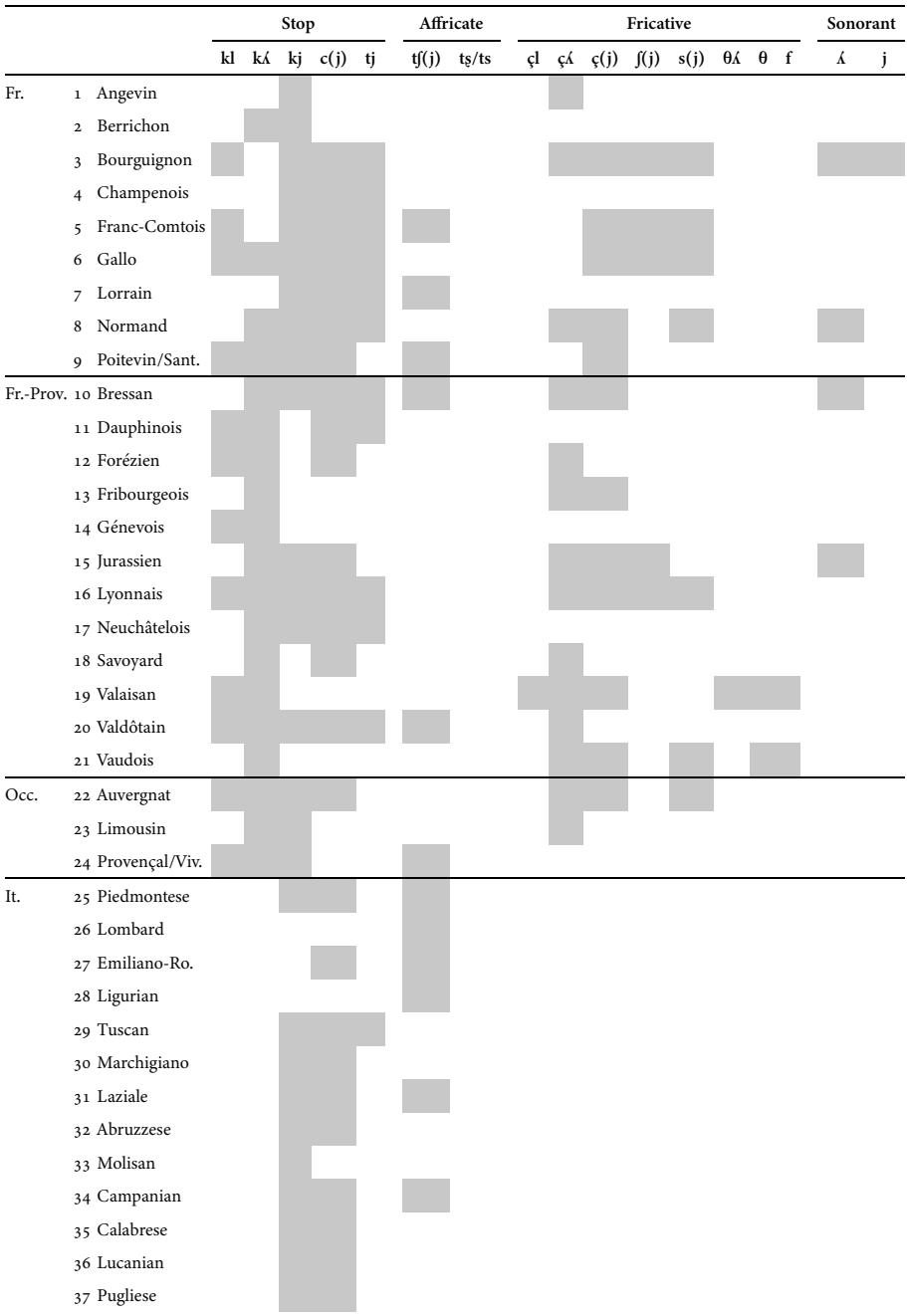

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Figure 1a. *(continued)*

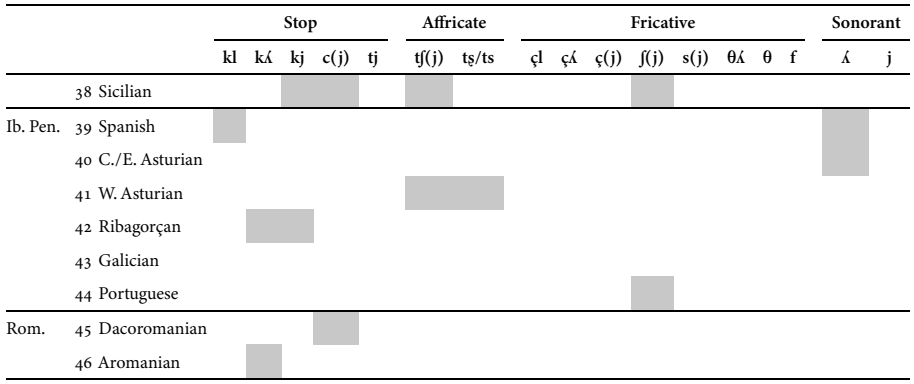

Figure 1a. Phonetic outcomes for word-initial /kl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur in Italy. Cells filled in dark gray indicate that the phonetic realization(s) appearing at a given column heading occur(s) in a given dialect

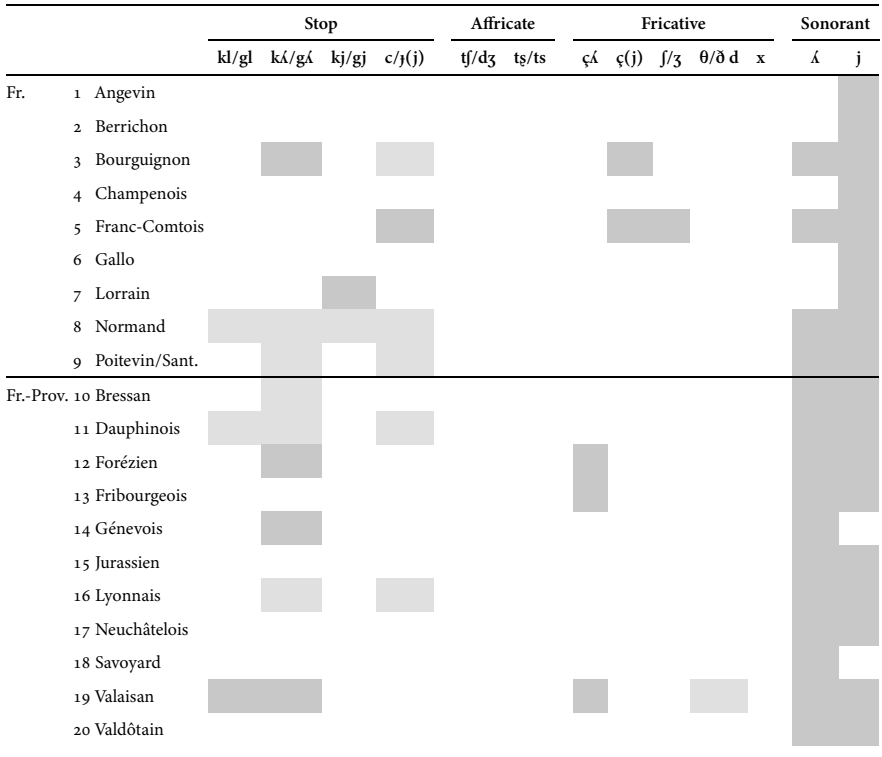

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Figure 1b. *(continued)*

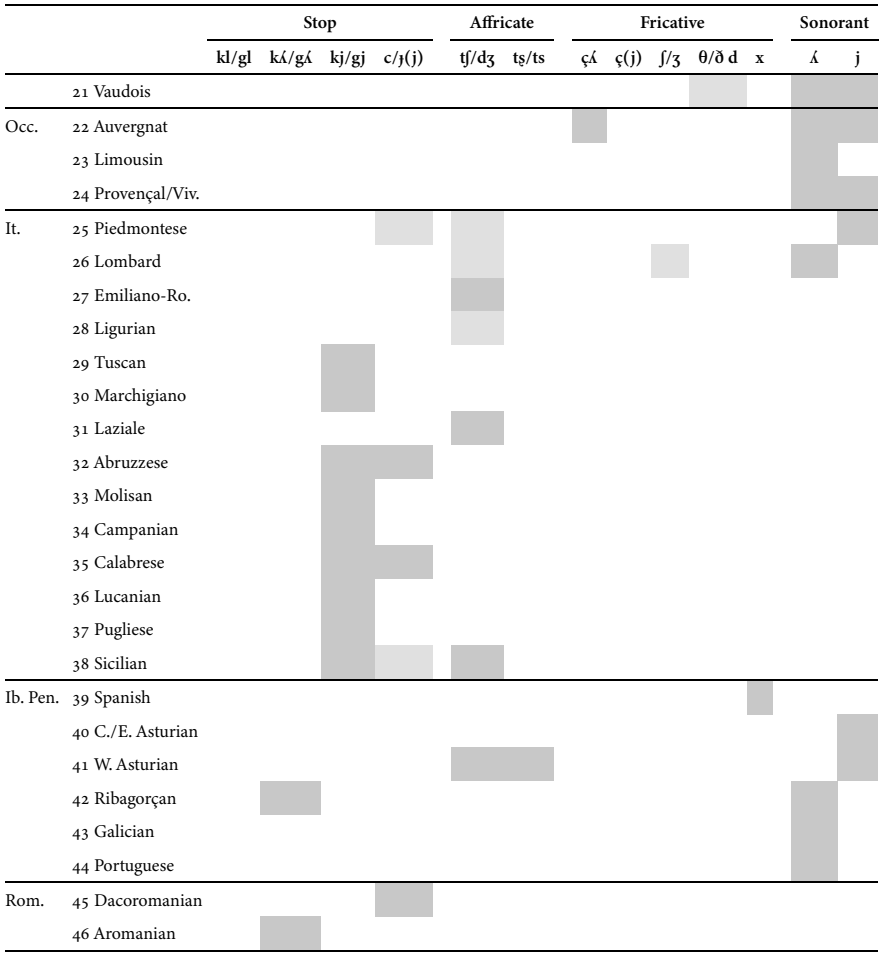

Figure 1b. Phonetic outcomes for word-medial intervocalic /kl/ in Romance dialects grouped according to manner of articulation and language domain. Cells are filled in dark gray for voiceless obstruent realizations or in light gray for voiced or voiced and voiceless obstruent realizations. The phonetic symbols do not account for instances of consonant lengthening which may occur in Italy

3.1.1 *Lateral vocalization*

As revealed by the upper pathway of Table 1, the sequence [kʎ] has given rise to [kj] in the first place, after which there is gestural blending between the dorsal gesture for the front velar, which is articulated at the back palate or palatovelar zone, and the dorsal or predorsal gesture for the (alveolo)palatal approximant [j] (see for a similar view Rousselot 1891: 199). Closure location for the end product [c] of

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this gestural blending process may occur at the hard palate exclusively or at the alveolar and palatal zones simultaneously, the resulting alveolopalatal stop realization often being identified as [tj]-like whenever being fairly anterior in French and Franco-Provençal dialects and also in Tuscan (see the geographical distribution of [tj] in Figure 1a). At a later stage, [c] may change to [tʃ] through the categorization of a relatively long and intense stop release burst as the fricative portion of a palatoalveolar affricate (for the similarity between the duration and intensity characteristics of the release burst for [c] and the frication period of [tʃ] in Greek, Romansh and Catalan dialects, see Lengeris and Kappa 2016, Schmid 2010, and Recasens and Espinosa 2009, respectively). Finally, [tʃ] may be deaffricated into [ʃ], the origin of this palatoalveolar fricative being the failure for the affricate closing phase to be heard in weakening conditions such as after the final vowel of the preceding word. A few examples of pathway (1) follow: [kʎaw] and [kjaw] for CLAVE 'key' in Ribagorçan Catalan; ['kjave], ['cave] and ['tjave] in Tuscan dialects and [tje] in Lorrain and Champenois (Rohlfs 1966: 243–245; Gilliéron & Edmont 1902–1910, map 301); [tʃaf] in Lombardy (Jaberg & Jud 1928–1940, map 889); ['tʃama], ['ʃama] for CLAMAT '(s)he calls' in Sicily.

Romance dialects differ regarding the number of sound changes which have taken place along the pathway /kl/ > [kʎ] > [kj] > [c] > [tʃ] > [ʃ] just described. According to Figure 1a, the sequence [kʎ] alone with no traces of the later phonetic outcomes is found in Franco-Provençal (13, 14, 19, 21) and Aromanian. With respect to the presence of [kʎ] combined with other phonetic realizations derived from it (mostly [kj] and possibly [c]), this situation holds in other Franco-Provençal dialects, Occitan and Ribagorçan Catalan where [kʎ] is always available and partly in French dialects where [kʎ] may occur or not. The presence of [kʎ] in a considerable number of cases in Galloromance strongly suggests that [kj] has derived from [kʎ] in localities where one or more sound changes have rendered this primitive consonantal sequence inaccessible, and [c] in Dacoromanian should also be traced back to [kʎ] in view of the occurrence of [kʎ] in Aromanian. In C./S. Italy, where the [Cʎ] source of those sound changes which have yielded essentially [kj], [c] and [tʃ] is absent, it may be inferred from the outcomes [ʎ] and its delateralized variant [j] of /gl/ (see §3.2).

An interesting areal difference regarding the pathway /kl/ > [kʎ] > [kj] > [c] > [tʃ] > [ʃ] is the extent to which the affricate has spread over some dialect regions rather than others (see Figure 1a). In Galloromance, [tʃ] occurs in a restricted number of dialects such as Franc-Comtois, Lorrain, Valdôtain and Provençal from the Alpes-Maritimes region (Dalbera 1994: 419). The affricate may be found more extensively outside the Galloromance domain whether in addition to [kj]/[c] or not: in Sassarese and Agordinian though not in Corsican, which has [c] exclusively (these languages and dialects are not included in the figure); in

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dialects from N. Italy (e.g., Val d'Ossola in Piedmont ['cama], ['tʃama] CLAMAT '(s)he calls') and further south in Italy including Sicily where the variant [ʃ] also occurs in the southeastern area of the island; in Galician ([tʃa'maɾ] CLAMARE 'to call') as well as in European Portuguese where [tʃ] changed to [ʃ] in modern times except for the northern dialects (Willians 1938: 63; Teyssier 1982: 45). A pathway /kl/ > [kʎ] > [kj] > [c] > [ʈʂ] > [ts] > [tʃ] has also been advocated for W. Asturian (García Arias 2003: 234–239) where the sequence [kj] issued from [kʎ] may still be found in the isolated Brañas region and [ʈʂ], [ts] and [tʃ] also derive from the retroflex outcome [ɖ] of word-initial /l/, which is still available in the locality of Sisterna (e.g., [ʈʂa'mar], [tʃa'mar] CLAMARE 'to call', ['ʈʂoβu] LUPU 'wolf').

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3.1.2 *Velar stop lenition*

According to another articulation-based phonetic pathway presented in Table 1, in Galloromance the velar stop may weaken into [ç] when followed by the alveolopalatal lateral thus giving rise to the sequence [çʎ] (i.e., [kʎ] > [çʎ] or better [cʎ] > [çʎ]). This and other stop lenition cases reported in the following sections may have been induced by the final vowel or non-stop consonant of the preceding word most probably in conjunction with the conflicting production requirements involved in the transition from the obstruent C1 to the laminodorsal lateral [ʎ] characterized in §1. Occasionally, [hʎ] and [hl] may be found instead of [çʎ] and [çl] whenever the same leniting process causes the lingual constriction for the (alveolo)palatal fricative to become so wide that a glottal fricative or approximant is generated, as exemplified by Valaisan [çʎa], [hʎa] and [hla] CLAVE 'key' (Gilliéron & Edmont 1902–1910, map 301, localities 978 and 979). As shown in Figure 1a, the two separate pathways [kʎ] > [kj] and [kʎ] > [çʎ] > [çj], possibly in addition to later outcomes, have taken place in Galloromance in a number of dialects of French (3, 5, 6, 8, 9), Franco-Provençal (10, 12, 15, 16, 18, 20) and Occitan (22, 23). Otherwise, there is [kj]/[c(j)] but not [çʎ]/[ç(j)] (2, 4, 7, 11, 17) or the reverse (19, 21).

The outcome [çʎ] of this stop weakening process has undergone several changes which are displayed in the four bottom rows of Table 1 and are described in (a), (b), (c) and (d) below. As shown in Figure 1a, these sound changes have occurred throughout the Galloromance-speaking domain except for Angevin, Forézien, Savoyard, Valdôtain and Limousin where [çʎ] has not evolved further.

a. [çʎ] has yielded [çj] through [ʎ] vocalization in dialect regions where the two phonetic outcomes [çʎ] and [çj] coexist (Lyonnais [çʎo], [çjo] GLACIE 'ice'; Gardette 1950–1976, map 1046).

b. [çj] may front to [ʃj] and [sj] (see dialects 3, 5, 6, 8, 15, 16, 21, 22) and all these fricative + yod sequences may drop the glide, as exemplified by [çʎe] and [ʃje]

CLAVE 'key' in Jurassien (Martin & Tuaillon 1971–1978, map 1053) and [ço], [ʃo] and [sjo] of CLAVU 'nail' in Franc-Comtois (Dondaine 1972–1991, map 425). The replacement of [ç] by [ʃ] and [s] is achieved through some lingual constriction fronting induced by the (alveolo)palatal glide [j], whose constriction location may be more anterior than that of the vowel cognate [i]. It takes place more often than the failure for this to happen (9, 10, 13), which is in accordance with [ç] being less stable articulatorily and/or perceptually than [ʃ] and [s], as revealed by its lower frequency of occurrence in language consonant systems (Maddieson 1984: 45).

c. There is [θ] in Valaisan (19) and Vaudois (21) where [çʎ] and [ç(j)] but not [c(j)] are also found (Vaudois [θa], Valaisan [θo] CLAVE 'key'; Gauchat et al. 1925, entry 103). Scholars have proposed two pathways included in Table 1 in order to account for this dental fricative end product, namely, [çʎ] > [çj] > [θj] > [θ] (Zimmerli 1899) and [çʎ] > [θʎ] > [θ], the intermediate sequence [θʎ] in the second pathway being available in localities of the canton of Vaud such as Ormont-Dessous (Haberli 1908: 24; Hasselrot 1937: 150; Dietrich 1945: 53). The motivation for the replacement of [çʎ] by [θʎ] and of [çj] by [θj] could be analogous to that for the substitution of [çj] by [ʃj] and [sj] referred to above and thus articulation-based: the tongue fronting coarticulatory effect exerted by [ʎ], which may exhibit an alveolar constriction, or by a highly constricted realization of [j] on preceding [ç] may have caused the (alveolo)palatal fricative to become as anterior as [θ] and therefore its spectral frequency peak to increase from ca. 4000–5000 Hz to 7000 Hz or a higher frequency (Jongman et al. 2000; Gordon et al. 2002). This sound change is in accordance with the presence in Franco-Provençal of very front lingual consonant articulations, as exemplified by the outcomes [ts]/[s] of Latin /ka/ instead of [ʃ], which occurs in standard French (Valaisan [tsɛ], [tsjɛ] CARU 'dear, masc. sing.', ['tsivrə] CAPRAS 'goats' vs. French [ʃɛʁ], [ʃɛvʁ]), and also by the outcome [θ] of Latin /ke ki tj kj/ instead of [s], which is the regular end product in Western Romance (Valaisan [θɛ̃] CENTU 'one hundred', [lɛ̃θwe] LINTEOLU 'sheet' vs. French [sɛ̃], [lɛ̃'sœl]) (Gauchat et al. 1925, entries 139, 178, 180, 480).[5]

Table 1 and Figure 1a also reveal that [θ] may be replaced by [f] in Vaud and Valais (W. Valaisan [ç(ʎ)u], [θu], [fu] CLAUDIT '(s)he closes'; Jeanjaquet 1931). In principle, this phonetic replacement could be based on acoustic equivalence given that [θ] and [f] share a relatively flat, low amplitude spectrum devoid of major distinctive spectral prominences up to 8000 Hz. Earlier studies have shown indeed that [θ] may be misperceived as /f/ (Miller & Nicely 1955) and that the identification of the frication noise of the dental

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fricative as /θ/ or /f/ may depend less on its spectral characteristics than on the shape of the vowel transitions (Harris 1958). This acoustico-perceptual explanation does not seem to account, however, for why [θ] > [f] occurs more frequently than [f] > [θ] in the world's languages (Blevins 2004: 134–135). According to Garrett and Johnson (2013), the change [θ] > [f] is not so much caused by acoustic equivalence as by perceptual enhancement of the labialization characteristic, i.e., ([θʷ] > [f]), which may be either inherently present in the frication noise (as reported for Glasgow English; Stuart-Smith et al. 2007) or induced by the coarticulatory effects exerted on [θ] by a contextual labial segment (as in Southern Sámi and the replacement of ['θwekos] 'clog, pl.' by [es'fwekos], [es'xwekos] in Judeo-Spanish; Kümmel 2007: 193; Wagner 1930: 17). The reverse, less common change [f] > [θ] appears to be often determined by a contextual front lingual articulation (see also Honeybone 2016). It has been reported to occur before /t/ in Albanian from Borgo Erizzo ([prift] from [priθ] 'priest'; Weigand 1911: 187) and before /l/ in Gothic (*θliuhan* and Old High German *fliohan* from Proto-Germanic *fleuhanan 'to flee'; Salmons & Iverson, 1993), and apparently can also be contextually unconditioned in Venetian dialects (['θemena] < *femena* for *femmina* 'female'; MacKay 2002: 31; Blevins 2004: 134).

d. The fricative [ç] of the sequence [çʎ] may lenite even further and be deleted thus yielding [ʎ] followed possibly by the vocalization of the alveolopalatal lateral into [j], as exemplified by dialects 3, 8, 10 and 15 of Figure 1a (Normand [çʎo], [ʎo] CLAUSU 'enclosure'; de Guer 1899). The outcome [ʎ] of /kl/ appears to have been achieved through this same deletion process in Spanish ([ʎa'maɾ] CLAMARE 'to call', ['ʎaβe] CLAVE 'key') and in C./E. Asturian where word-initial /l/ has shifted to [ʎ] as well ([ʎa'maɾ], ['ʎaβe], ['ʎana] LANA 'wool') (Repetti & Tuttle 1987: 103). However, the alternative process [kʎ] > [kj] > [c] > [tʃ] advocated in §3.1.1, involving the maintenance of the stop after another (nasal) stop instead of its lenition to a weaker segment, should be assumed in order to account for the palatoalveolar affricate of the Spanish word ['kontʃa] CONCHULA 'shell'.

5. A third phonetic pathway [çʎ] > [çð] > [θ] proposed by Gilliéron (1880: 59) has not been included in Table 1 in view of the articulatory complexity and dialect unavailability of the sequence [çð] in Valaisan and Vaudois. It nevertheless cannot be totally discarded in view of the fact that [ʎ] may give rise to [ð]/[d] not only word-medial intervocalically ([a'vəðə] APICULA 'bee', [õðə] UNGULA 'nail', ['paðə], ['padə] PALEA 'straw' in Valaisan-speaking localities; Gilliéron 1880; Gauchat et al. 1925, entry 198) but also in the labial clusters subject to analysis in §4 though probably not in the case of /fl/ where a change in place of articulation for the already existing fricative, i.e. [fʎ] > [çʎ] > [θʎ], seems most advisable (see §5).

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3.2 Word-initial /gl/

Table 2. Diachronic pathways for word-initial /gl/

/gl/	> gʎ	> gj	> ɟ(j)	> dʒ	> ʒ
				> dz, j	
		> ɣʎ	> ʎ(:)	> j, ð/d	
				> ɟ(:)	> dʒ > ʒ
					> c > tʃ

The dialect phonetic realizations and reconstructed diachronic pathways for word-initial /gl/ are shown in Figure 2a and Table 2, respectively. In parallel to /kl/, the two consonants of the cluster /gl/ may blend into [gʎ], which, analogously to [kʎ], occurs in some dialect regions but not others and should be considered the source of later phonetic end products. The two pathways described in §3.2.1 and §3.2.2 below, which start out with analogous sound changes to those discussed for /kl/ in §3.1.1 and §3.1.2, may be suggested in order to handle these data.

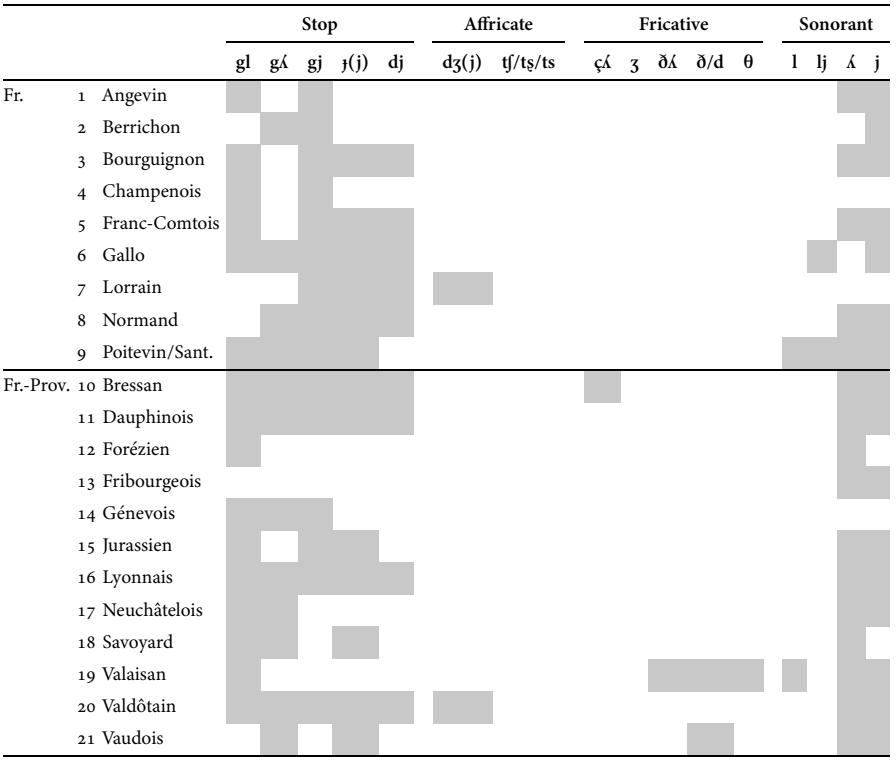

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Figure 2a. *(continued)*

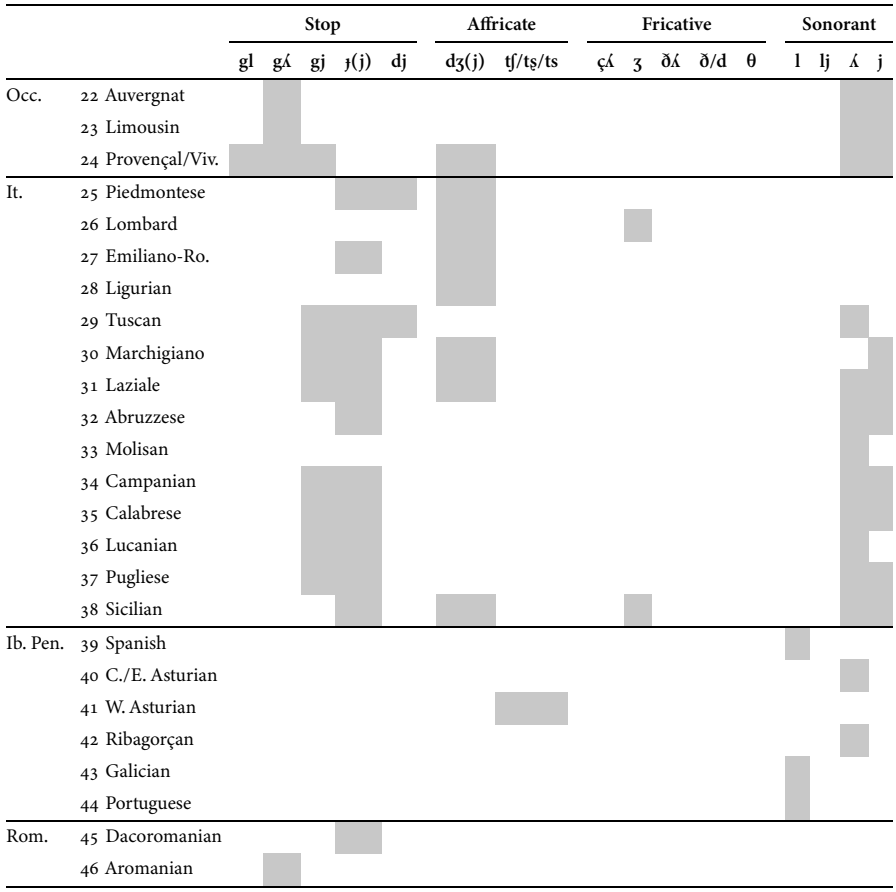

Figure 2a. Phonetic outcomes for word-initial /gl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur in Italy

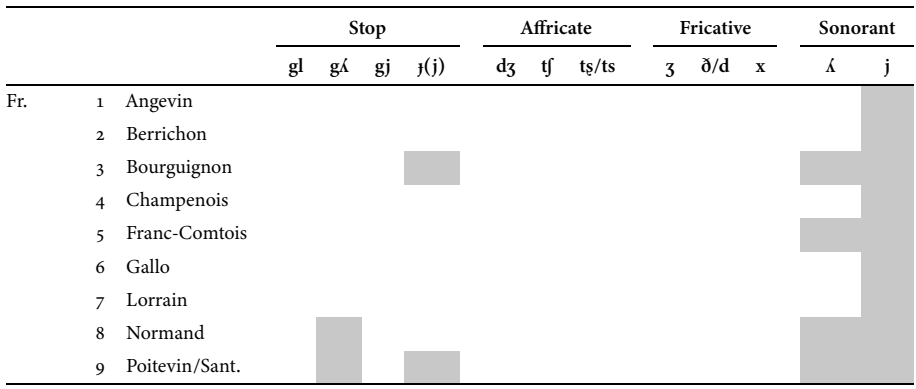

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Figure 2b. *(continued)*

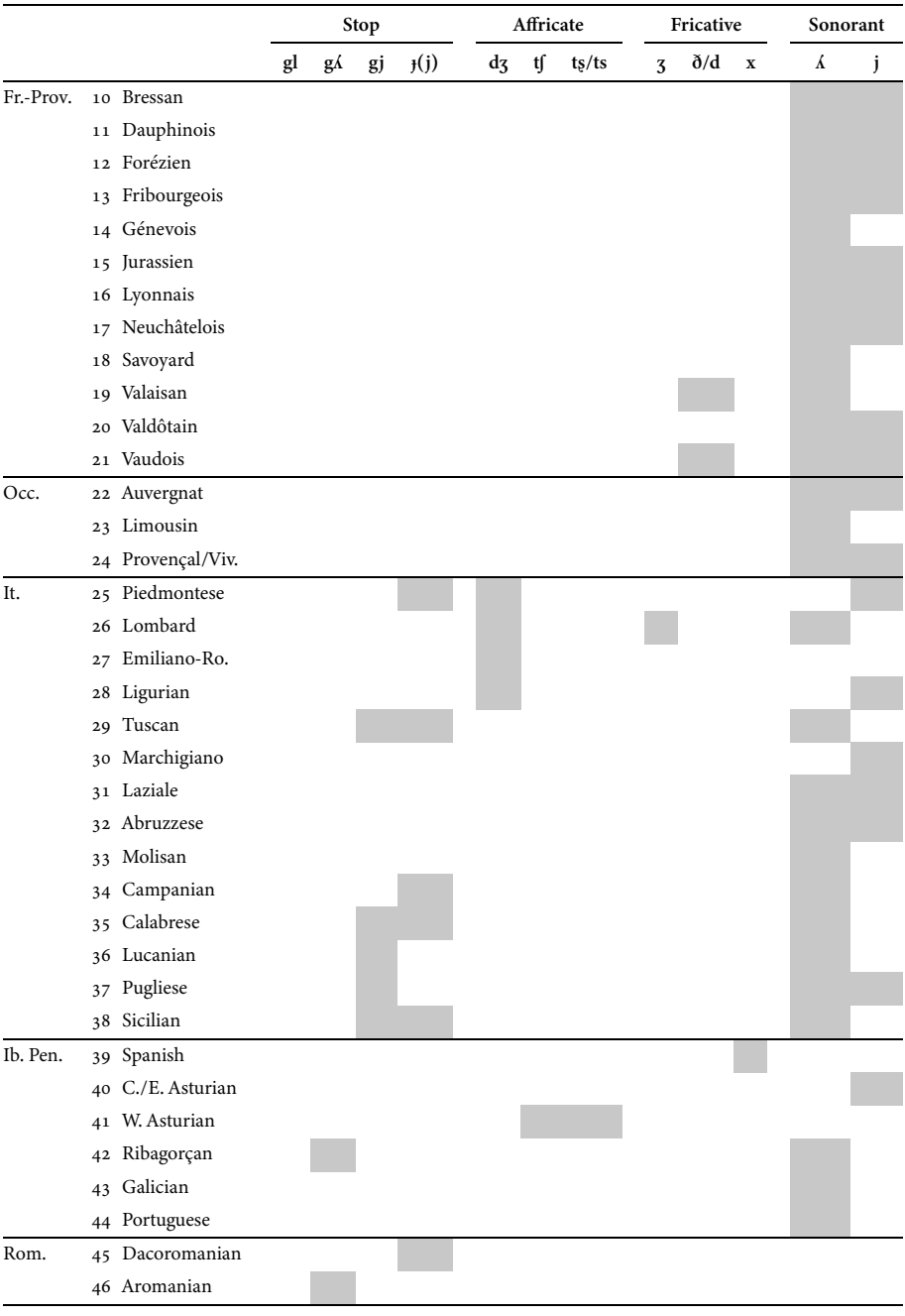

Figure 2b. Phonetic outcomes for word-medial intervocalic /gl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur word-medial intervocalically in Italy

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3.2.1 *Lateral vocalization*

According to the upper pathway of Table 2, [gʎ] shifts to [gj] through vocalization of the alveolopalatal lateral followed by gestural blending between the stop and the approximant yielding [ɟ(j)], which, as shown by dialect data presented in Figure 2a, may be heard as [dj]. At a later stage, this (alveolo)palatal stop may shift to the voiced palatoalveolar affricate [dʒ], which may later be deaffricated into [ʒ]. All changes along the pathway [gʎ] > [gj] > [ɟ(j)] > [dʒ] > [ʒ] may be attributed to the same articulatory and aerodynamic mechanisms identified for /kl/ in §3.1.1.

Figure 2a also shows that in contrast with [kʎ] and except for Aromanian, [gʎ] does not occur by itself anywhere in Galloromance, i.e., [gʎ] cooccurs with [gj]/[ɟ(j)] whether in addition to the palatoalveolar affricate end product [dʒ] or not, and often with [ʎ]/[j] derived from [ɣʎ] according to a pathway described in §3.2.2. This scenario is found in a number of French and Franco-Provençal dialects and in Provençal Occitan (Norman [gʎaʃ], [gjaʃ]/[gjɛʃ], [ʎa]/[ja] GLACIE 'ice'; de Guer 1899). In a few French- and Franco-Provençal-speaking zones (e.g., 1, 7, 15) as well as in Dacoromanian and all over Italy, those other phonetic realizations are found in the absence of [gʎ] (Ossola [ɟaʃ] GLACIE, Sicilian ['ɟ:an:a] GLANDE 'acorn'; Rohlfs 1966: 250). As pointed out for /kl/, the presence of [gʎ] in Aromanian suggests that [ɟ] in Dacoromanian should be traced back to [gʎ] as well.

The outcome [dʒ] of the voiced (alveolo)palatal stop happens to occur in most dialect areas where [c] derived from /kl/ has yielded [tʃ], i.e., Lorrain, Valdôtain, Provençal as well as N. Italy (Val d'Antrona in Piedmont ['dʒaʃa], [ɟaʃ] GLACIE; Nicolet 1929). There is also [dʒ] in Agordinian and Sassarese while Gallurese and Corsican still keep the stop source [ɟ]. On the other hand, [ɟ] instead of [ʎ] may have vocalized into [j] in those few dialects where [j] cooccurs with [gj]/[ɟ] or [dʒ] and there is no [ʎ] (2, 6).

3.2.2 *Velar stop lenition*

Another pathway presented in Table 2 involves the string of changes [gʎ] > [ɣʎ] > [ʎ] and thus lenition and later deletion of the velar stop just as [kʎ] (/kl/) may shift to [çʎ] and then to [ʎ]. As Figure 2a shows, this pathway has been completed in a number of French and Occitan dialects, all over Franco-Provençal (except for Génevois which has stopped at the [ɣʎ] stage), C. and S. Italy, C./E. Asturian and Ribagorçan Catalan (Neapolitan ['ʎantrə], ['ʎan:ə] GLANDE 'acorn', Ribagorçan Catalan ['ʎeβa] GLEBA 'clod', ['ʎera] GLAREA 'gravel'; Repetti & Tuttle 1987: 56). Whether cooccurring with [gʎ] or not, the presence of the outcome [ʎ] indicates that [gʎ] must have existed in all these dialect areas. Moreover, as a comparison between Figures 1a and 2a shows, the fact that [ʎ] derives more often from /gl/

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than from /kl/ is in accordance with the close relationship between stop voicing and lenition, i.e., lenition is more likely to sit on voiced than on voiceless stops in line with the lower intraoral pressure level involved in the production of stops of the former class (Ohala & Solé 2010). Two further articulation-based changes operating on the end product [ʎ] of [gʎ], which have been included in Table 2, are worth mentioning. On the one hand, there has been [ʎ] vocalization into [j] in a considerable number of Galloromance dialects (Normand [gʎaʃ], [gjaʃ]/[gjɛʃ], [ʎas], [jas] GLACIE 'ice'; de Guer 1899), Fassan Ladin and C./S. Italy (N. Abbruzzi ['ʎanna], ['jan:ə] GLANDE; Rohlfs 1966: 250; Jaberg & Jud 1928–1940, map 593). On the other hand, the alveolopalatal lateral has been fronted into [ð], and also the stop realization [d], in Valais and Vaud, e.g., GLACIA 'ice' may be implemented as ['ʎaʃ], ['ðaʃ], ['daθə] and ['jaʃ] in Valaisan depending on locality (Gauchat et al. 1925, entry 41, and see footnote 5).

Figure 2a also shows that in Galloromania and C./S. Italy [ʎ]/[j] often cooccur with [gj]/[ɟ(j)] and even [dʒ] (e.g., the realizations [ɟ(:)], [(d)ʒ] and [ʎ(:)] happen to be all available in Sicily), while in France but not in Italy [gʎ] may also be found. Regarding Galloromance, very much like in the case of /kl/, the outcomes [gj]/[ɟ] and [ʎ]/[j] of /gl/ must have been generated through independent developments, i.e., [gʎ] > [gj] > [ɟ] described in §3.2.1 and [ɣʎ] > [ʎ] > [j] described in the present section. In spite of the similarity of phonetic outcomes with Galloromance, however, a single phonetic development included in Table 2 has been advocated for C./S. Italy by which [ɟ] emerged not from [gj] but from the outcome [ʎ] of [gʎ] through the pathway /gl/ > [gʎ] > [ɣʎ] > [ʎ(:)] > [ɟ], the end product [j] of [ʎ] being also possible in the same dialect domain (see Rohlfs 1966: 250, 396–397 and also Repetti and Tuttle 1987: 81 according to whom the string of changes /gl/ > [gʎ] > [ɣʎ] > [ʎ] > [j] > [ɟ] would be more suitable). Both consonants [ʎ] and [ɟ] derived from /gl/ coexist from Lazio, Umbria and Marche southwards including Sicily where [ɟ] may have changed to [dʒ] and the affricate to [ʒ] (e.g., Calabrian ['ʎ:annə], ['ɟ:anda], Sicily ['ʎ:anna], ['ɟ:an:a], ['dʒana] GLANDE 'acorn'; Jaberg & Jud 1928–1940, map 593; Rensch 1964; Tuttle 1975). The replacement of [ʎ] by the occlusive [ɟ] is rather unusual and reminds us of the replacement of /ʎ/ by [ʝ] and [ʒ] in Spanish dialects (see §1). It involves a gain in tongue dorsum contact which is likely to take place in strong positions such as word-initially and postconsonantally, i.e., the tongue contact surface at the hard palate is greater for [ɟ] than for [ʎ] and the stop but not the lateral can be purely palatal. An apparent reason why in contrast with Galloromance two separate pathways should not be advocated in S. Italy is that [ɟ(:)] has also arisen from [ʎ] derived from etymological /lj/ in this region (see §3.3); therefore, it makes sense to consider that /gl/ and /lj/ merged into [ʎ(:)] at some point in history and that [ɟ(:)] arose from [ʎ(:)] at a later date. It may thus be concluded that the palatal stop

end products [c] of /kl/ and [ɟ] of /gl/ have evolved differently from the earlier sequences [kʎ] and [gʎ], respectively, in S. Italy, i.e., through [kj] the former cluster and through [ʎ] the latter.[6]

The scenario for /gl/ in the Iberian Peninsula requires a specific analysis. Regarding Asturian, the outcomes [ʎ] (C./E. Asturian) and [ʈʂ]/[ts]/[tʃ] (W. Asturian) of /gl/ coincide with those for word-initial /l/ (see also §3.1.2). Thus, there is [ʎ] in ['ʎeɾa] GLAREA 'wasteland' and in ['ʎana] LANA 'wool' in the former area and an affricate in the corresponding forms ['ʈʂeɾa] and ['ʈʂana] in the latter area, other less widespread lexical variants in W. Asturian being ['tʃeɾa] (e.g., Luna valley) and ['ɖejɾa] (Sisterna; Fernández 1960). Two explanatory hypotheses, both of which may be accounted for articulatorily, may be proposed to handle these data. According to one of them, [ʎ] in C./E. Asturian and the lingual affricates in W. Asturian would have emerged word-initially from the lenited sequence [ɣʎ]. According to another pathway (not included in Table 2), [ɣl] would have been simplified into [l] after which the alveolar lateral would have undergone the same changes as word-initial /l/, thus being reinforced into [ʎ] through a gain in linguopalatal contact size in eastern and central Asturian and becoming first [ɖ], then [ʈʂ] and later [ts] and [tʃ] in the western Asturian region. This cluster simplification process [gl] > [ɣl] > [l] has also taken place in Spanish (also in Galician and in Portuguese) where we find words starting with either [gl]/[l] or just with [l] such as *glera*/*lera* GLAREA 'wasteland', *glande*/*lande* GLANDE 'acorn' and *latir* GLATTIRE 'to beat' (Menéndez Pidal 1968: 126–127).

6. In contrast with this view, it has been claimed that the outcome [ʎ] of /gl/ in S. Italy has not been issued from [gʎ] but from [ʝʎ] through the phonetic development /gl/> [ʝl] > [jl] > [jʎ] > [ʎ] where velar vocalization occurred in the syllable-final position (Barbato 2005: 411; see also Zampaulo 2019: 56–57). There are problems with the replacement of /gl/ by [ʝl]. Firstly, linguopalatal contact data (Recasens & Pallarès 2001) reveal that, if there is no gestural blending between the velar and following /l/ yielding [gʎ], the velar stop is not likely to become palatal but stay plain velar and thus be realized as [g] or as [ɣ]. Moreover, the assumption that C1 should be syllable final and C2 syllable initial for the former consonant to vocalize into [j] cannot hold word-initially where the cluster /gl/ has also yielded [ʎ] in a considerable number of Romance languages and dialects (see Figure 2a). Finally, the assumption that coda [j] may cause following /l/ to shift to [ʎ] and thus [jl] to become [jʎ] is also problematic. Thus, unlike the frequent replacement of /lj/ by [ʎ] (and /nj/ by [ɲ] and /kj tj/ by [c]) in Romance, the conversion of a dentoalveolar into an alveolopalatal or palatoalveolar consonant through progressive assimilation is feasible for the nasal stop (e.g., dial. Catalan ['kuɲə] for standard Catalan ['kujnə] COQUINA 'kitchen') and for the oral stop (e.g., Spanish ['mutʃo] from ['mujto] MULTU 'a lot') but rare for the alveolar lateral mostly if dark since its articulatory configuration is likely to jeopardize the tongue body raising and fronting process (see Introduction).

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3.3 Word-medial intervocalic /kl gl/

The present section concerns the extent to which the intervocalic outcomes for /kl/ and /gl/ agree or disagree with those occurring word-initially by comparing Figures 1a and 2a with Figures 1b and 2b.

As pointed out in §2, in Standard French, Catalan and Romansh (not included in the figures of the present study), /kl/ and /gl/ have stayed unmodified word-initially and have changed into [ʎ] word-medial intervocalically through stop voicing and lenition after which [ʎ] was replaced by [j] in French. This scenario shows that stops are more prone to lenite word-medial intervocalically than word-initially.

Whenever the two-consonant clusters have been modified word-initially and word-medially, the corresponding phonetic outcomes may be the same (Aromanian [kʎ], [gʎ]; Dacoromanian [c], [ɟ], as in *chiar* CLARU 'clear' and *ochiu* OCULU 'eye') or different. In the latter event, and as shown by the Galloromance data, there is a trend towards the presence of articulatorily stronger phonetic realizations word-initially than word-medial intervocalically and for the voiceless cluster /kl/ than for the voiced cognate /gl/. Thus, /kl/ and /gl/ have yielded two-consonant sequences ([kʎ]/[kj], [çʎ]/[çj] for /kl/; [gʎ], [gj] for /gl/), stops ([c], [ɟ]), affricates ([tʃ], [dʒ]) and fricatives ([ç]/[ʃ]/[s], [ʒ]) much more often word-initially than word-medially, while the sonorant end products [ʎ] and [j] achieved through the pathway [ɣʎ] > [ʎ] > [j] may be found for /gl/ but practically not for /kl/ word-initially and, as the following examples demonstrate, highly often for the two syllable-onset clusters in the word-medial position: Ain [oˈɾeʎə], [oˈɾɛʎ] AURICULA 'ear' and [vəˈʎe], [veˈje] VIGILARE 'to look out', Fribourgeois [ˈviʎo] VECLU < VETULU 'old, masc. sing.' and [kaˈʎi] COAGULARE 'to curdle', Valdôtain [kaˈʎa], [kaˈja] COAGULATU 'curdled' (Haefelin, 1879: 55; Gilliéron & Edmont 1902–1910; maps 946, 1355; Keller 1958).

The scenario for Italy is more problematic. As for N. Italy, word-medial /kl/ and /gl/ may have yielded stops and affricates as a general rule, which should have been generated through the same articulation-based pathways which have operated word-initially. Rohlfs (1966: 349–350, 354) proposed accordingly the comparable developments [kj] > [gj] > [ɟ] > [dʒ] and [kːj] > [c] > [tʃ] for the phonetic outcomes occurring, respectively, in the western and eastern regions of N. Italy exemplified next:

- (Western region) Piedmontese from Valsesia [ˈøɟːu] OCULU 'eye', Lombard [lenˈtidʒa] LENTICULA 'lentil', [ˈstɾidʒa] STRIGILE 'curry comb', Ligurian [ˈødʒu] OCULU 'eye', [ˈvɛdʒa] VIGILARE 'to look out'.
- (Eastern zone) Venetian [ˈotʃo] OCULU, [ˈtetʃa] TEGULA 'tile', Emilian [ˈotʃ], [ɔc] OCULU 'eye'.

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In addition, Rohlfs himself suggested the alternative development [ɣʎ] > [ʎ] > [j] > [ɟ] > [dʒ] (or perhaps [ɣʎ] > [ʎ] > [ɟ] > [dʒ], [j]) for other Piedmontese areas where /kl/ has yielded not only [dʒ] but also [j], which has also been issued from /lj/ in this region ([lanˈtədʒa], [lanˈtija] LENTICULA, [øc], [øj] OCULU, [ˈpaja] PALEA, straw'; Jaberg & Jud 1928–1940, maps 101, 655, 1377). According to Repetti and Tuttle (1987: 65–69), on the other hand, an analogous pathway [ɣʎ] > [ʎ] > [j] > [ɟ] > [dʒ] > [tʃ] would have also operated on intervocalic /kl/ (and also on /lj/) in the Venetian region based on early Old Venetian written forms such as *oio, ogio* and *ocio* OCULU, which would correspond to different stages of this phonetic derivation. A comment to be added to this diachronic pathway is that the reinforcement of [j] into [ɟ] is not expected to occur in the leniting word-medial intervocalic position, a shortcoming which could be avoided by splitting it into the two phonetic developments [ɣʎ] > [ʎ] > [ɟ] > [dʒ] and [ɣʎ] > [ʎ] > [j].

Turning now to C./S. Italy (including Umbria, Abruzzi and Marche) and as a comparison between the data available in Figures 1a and 1b reveals, blending of [kj] into [c] has operated on /kl/ not only word-initially but also word-medial intervocalically since, unlike Galloromance, a long stop closure ([k:j]) has prevented velar stop voicing from taking place in the latter word position (e.g., Apulian, Calabrian [ləntiˈc:ə] LENTICULA, Sicilian [ˈɔk:çu], [ˈoc:u] OCULU). Moreover, word-initial /gl/ and word-medial /gl/ and /lj/ share to a large extent the same phonetic outcomes [ʎ(:)], [j] or [ɟ(:)] depending on dialect zone and locality (see Figures 2a and 2b), as exemplified by [ˈstɾeʎa] STRIGILA 'curry comb' and [ˈfiʎo] FILIU 'son' in Cilento in Campania, [ˈstɾija] and [ˈfiju] in Lecce in Apulia and [ˈstɾiɟ:a] and [ˈfiɟ:u] in S. Calabria (Tuttle 1975). The two complementary articulation-based pathways [ɣʎ] > [ʎ(:)] > [ɟ(:)] > [dʒ] and [ɣʎ] > [ʎ(:)] > [j] which have been advocated for N. Italy above could handle these intervocalic data for S. Italy.

Shifting now to the Iberian Peninsula, Galician and Portuguese exhibit reinforced and lenited outcomes of /kl/ depending on word position, i.e., [tʃ]/[ʃ] word-initially vs. [ʎ] word-medially, the latter outcome being issued from [ɣʎ] and available for word-medial /gl/ as well. In C./E. Asturian and Spanish, however, stop lenition has operated on /kl/ not only word-initially (§3.1.2) but also word-medially yielding, as for word-medial /gl/, the alveolopalatal lateral outcome [ʎ]. At a later date, word-medial [ʎ], also if derived from /lj/ but not from /ll/, evolved into [j] in C./E. Asturian and into [x] in Spanish through the intermediate sound changes referred to in §1. These phonetic outcomes are apparent in the C./E. Asturian forms [aˈβeja] APICULA 'bee', [ˈreja] REGULA 'rule', [ˈfweja] FOLIA 'leaf' and -[ˈjeʎu] suffix -ELLU and the Spanish cognates [aˈβexa], [ˈrexa], [ˈoxa] and -[ˈjeʎo]. W. Asturian, on the other hand, shows the same phonetic outcomes [ʦ], [ts] and [tʃ] for word-initial and word-medial /kl gl/ and for

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word-medial /lj ll/ (e.g., [aˈβejtʃa], [ˈrejtʃa], [ˈfwetʃa], -[ˈi/eʈ̟su]). In contrast with C./E. Asturian, in this particular case different word-position dependent pathways appear to be needed (see also García Arias 1975: 178): those pointed out in §3.1.1 and §3.2.2 for the word-initial position and only ([ɣʎ]) > [ʎ] > [ɟ] > [c]/[dʒ] > [tʃ] for the word-medial intervocalic position, which parallels the pathway for the dialects of Italy referred to above.

4. Labial consonant clusters

While the phonetic pathways presented in Tables 3 and 4 concern word-initial /pl/ and /bl/, they can be extended to the word-medial intervocalic position to a large extent. Indeed, a comparison between Figures 3a and 3b and between Figures 4a and 4b reveals that /pl/ and /bl/ have evolved similarly word-initially and word-medial intervocalically in Galloromance and in Italy independently of whether /pl/ changed to [bl] in the latter word position or not. Thus, analogous phonetic end products may be found in the two word positions, as exemplified by PLUMU 'lead' and DUPLU 'double' in Poitevin/Santongeais ([pʎɔ], [pjɔ]; [dubʎ], [dubj]), Swiss Franco-Provençal ([plõ], [pʎõ]; [dɾɔbl], [dɾɔbʎ]) and northern and central Italy ([pjommo], [pjomp]; [ˈdop(:)jo]) (Gilliéron & Edmont 1902–1910, maps 420, 1038; Jaberg & Jud 1928–1940, maps 408, 831). Relevant word-position dependent differences occur with respect to specific aspects, which will be described in §4.1 and §4.2, such as the extent to which /pl/ has yielded affricate consonant outcomes word-initially rather than word-medially.

4.1 /pl/

Table 3. Diachronic pathways for word-initial /pl/

/pl/	> pʎ	> pj	> pç	> pθ, pð	> pf	
			> pc	> ptʃ, c	> tʃ	> ʃ
		> pθ, pð	> pf			
		> ɸʎ	> ʎ			

A difference between the phonetic developments for /pl/ and /kl/ in the word-initial position is that the stop is less prone to lenite into a fricative if labial than if velar and thus in the former sequence than in the latter. Different pathways may be identified for /pl/ after its conversion into [pʎ] in Table 3, which exhibit

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changes in C2 such as vocalization followed by glide strengthening ([pj], [pc]) or else C1 weakening ([ɸʎ]).

4.1.1 *Lateral vocalization*

The most common development for /pl/ involves the vocalization of the alveolopalatal lateral into [j] and therefore the change [pʎ] > [pj]. According to Figure 3a, Galloromance dialects may exhibit either the two sequences [pʎ] and [pj] (e.g., Fribourgeois [pʎa]/[pja] PLOVIT 'it rains'; Gauchat et al. 1925) or else [pj] but not [pʎ] though not the reverse combination and thus [pʎ] but not [pj]. Analogously to the voiceless velar stop clusters, it may be ascertained then that [pj] derives from [pʎ] in French, Franco-Provençal and Occitan and that there is a trend for easing the articulation of the complex cluster [pʎ] by vocalizing the alveolopalatal lateral through gestural undershoot and thus a decrease in linguopalatal contact size. Perhaps in support of the hypothesis that [pj] derives from [pʎ] rather than directly from [pl] due to the similar acoustic characteristics between the alveolar lateral and the palatal glide one could adduce the fact that [pʎ] and [kʎ] occur in very similar Franch, Franco-Provençal and Occitan dialect domains (compare the data reported in Figures 1a and 3a). Except for Ribagorçan Catalan, [pʎ] is absent from the other Romance languages listed in the table while [pj] may be found in N. and C. Italy. Since, differently from [kʎ], the sequence [pʎ] cannot have emerged through gestural blending between the articulatory gestures for the labial stop and the following alveolar lateral, a spontaneous /l/ palatalization process induced by the previous existence of [kʎ] and [gʎ] is the most likely explanation for why /pl/ could change to [pʎ]. In agreement with this assumption, there are Galloromance dialects which have [kʎ] but not [pʎ] (6, 11, 16, 20) while the reverse does not hold.[7]

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7. Supporting evidence for /l/ palatalization having taken place earlier in /Cl/ clusters with velars than with labials may be adduced. In Old Middle Age documents of Paduan provenance /kl/ had already gone through a series of changes by the time that /pl bl/ were replaced by [pj bj] in the 15th c. (14th c. *yamà* CLAMARE 'to call', *ianda* GLANDE 'acorn', *yharo* CLARU 'clear'; Repetti & Tuttle 1987: 68). In 14th c. Lyonnais, /pl/ and /bl/ were still articulated with the alveolar lateral while the clusters /kl/ and /gl/ had undergone already the /l/ palatalization process at least in the word-medial position, as exemplified by the forms *droblos* DUPLOS 'double, masc. pl.', *agenolier* ADGENUCULARI 'to kneel down' and *velli* VIGILIA 'eve' where the digraphs *li, ll* stand for [ʎ] (Philipon 1884: 558). Moreover, very early instances of /l/ palatalization after /g/ may be found in place names from the Franco-Provençal-speaking domain, i.e., *Lieresse* for *Gleresse* derived from GLAREA where *li* corresponds to [ʎ] (12th c.; Jaccard 1906: 188).

			Stop										Affricate		Fric.	Son.
			pl	pʎ	pj	pç	pθ	pð	pf	p(t)ʃ	kj	c/ɟ	tʃ(j)	ts/ʦ	ʃ	ʎ
Fr.	1	Angevin	■		■											
	2	Berrichon	■													
	3	Bourguignon	■	■	■											
	4	Champenois	■		■											
	5	Franc-Comtois	■		■	■										
	6	Gallo	■		■											
	7	Lorrain	■		■											
	8	Normand	■	■	■											
	9	Poitevin/Sant.	■	■	■											
Fr.-Prov.	10	Bressan	■	■	■	■										
	11	Dauphinois	■													
	12	Forézien	■	■	■											
	13	Fribourgeois		■	■	■										
	14	Génevois	■	■												
	15	Jurassien	■	■	■											
	16	Lyonnais	■		■											
	17	Neuchâtelois	■	■	■	■										
	18	Savoyard	■	■	■											
	19	Valaisan	■	■	■	■	■	■	■	■						
	20	Valdôtain	■		■											
	21	Vaudois	■	■	■	■	■		■							
Occ.	22	Auvergnat	■	■	■											
	23	Limousin	■	■	■											
	24	Provençal/Viv.	■	■	■								■			
It.	25	Piedmontese			■								■			
	26	Lombard			■	■				■			■			
	27	Emiliano-Ro.			■											
	28	Ligurian											■			
	29	Tuscan			■											
	30	Marchigiano			■											
	31	Laziale			■						■		■			
	32	Abruzzese	■		■						■	■				
	33	Molisan									■	■				
	34	Campanian									■	■	■			
	35	Calabrese									■	■				
	36	Lucanian									■	■				
	37	Pugliese									■	■				
	38	Sicilian									■	■	■		■	

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Figure 3a. *(continued)*

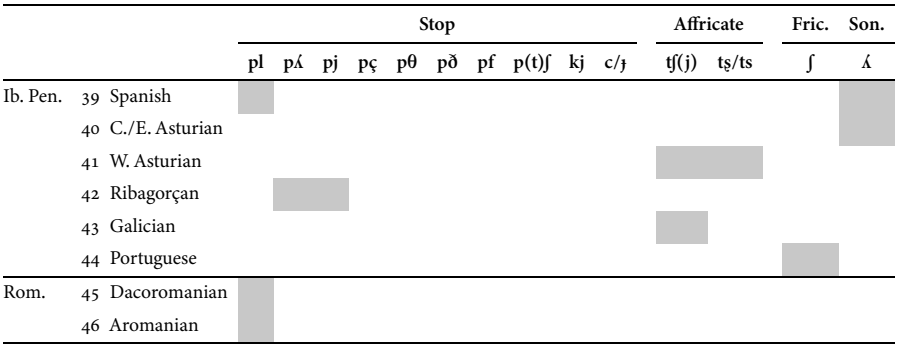

Figure 3a. Phonetic outcomes for word-medial intervocalic /pl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur in Italy

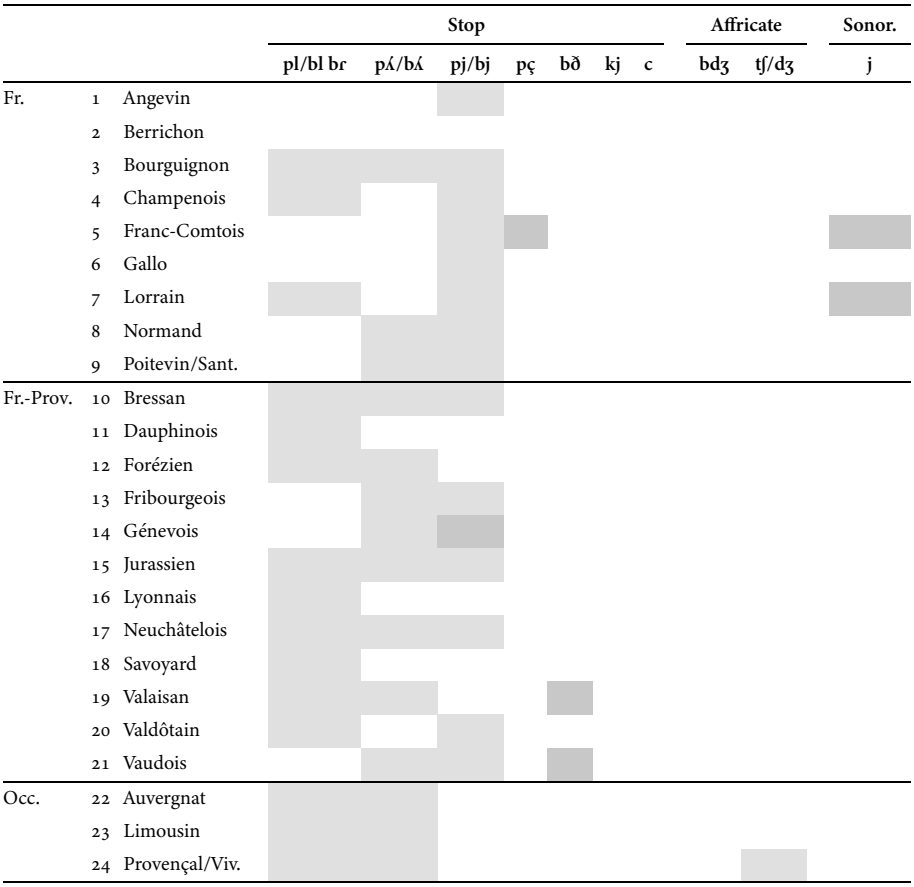

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Figure 3b. *(continued)*

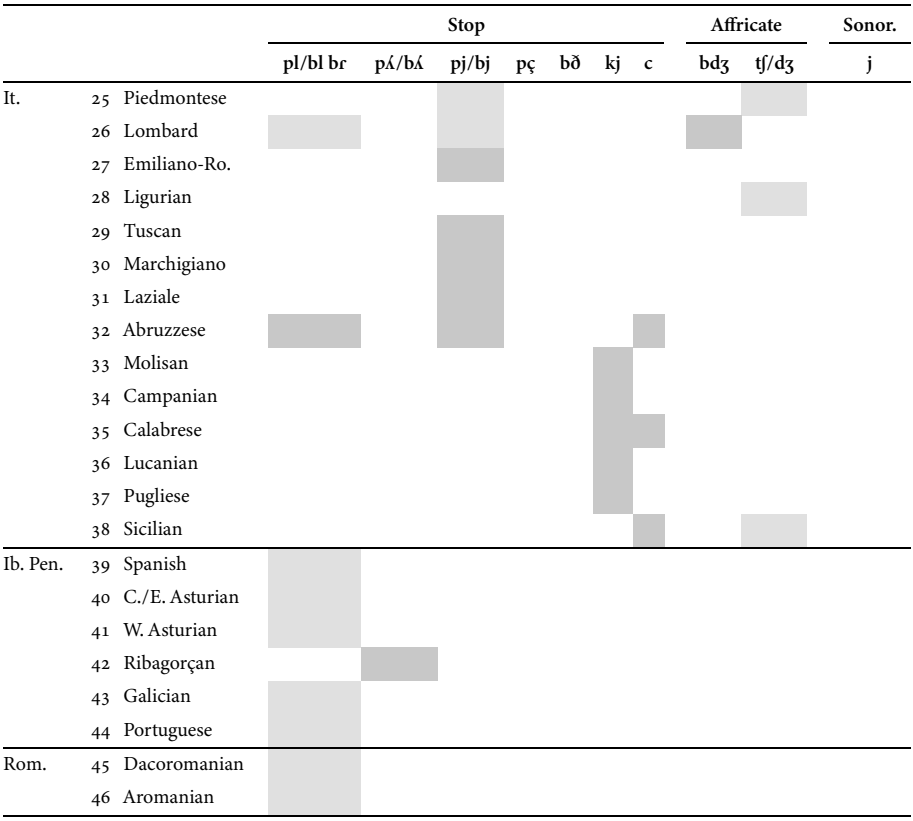

Figure 3b. Phonetic outcomes for word-medial /pl/ in Romance dialects grouped according to manner of articulation and language domain. Cells are filled in dark gray for voiceless obstruent realizations or in light gray for voiced or voiced and voiceless obstruent realizations. The phonetic symbols do not account for instances of consonant lengthening which may occur word-medial intervocalically in Italy

As shown by the upper pathway of Table 3, the reinforcement of the palatal glide into a front lingual fricative through an increase in constriction narrowing accounts for the sequence [pç] in Franc-Comtois and some Franco-Provençal dialects ([pçɛ̃] PLENU 'full, masc. sing.' in Vaud; Gauchat et al. 1925 entry 240) where it happens to always cooccur with [pj]. More articulatorily anterior forms are also available, which parallel those found for /kl/ and /gl/, i.e., [pð] in Valaisan and also [pθ] in Vaudois and Valaisan from which [pf] may derive ([pθɛ̃] PLENU 'full, masc. sing.', [pfoˈɾa] PLORARE 'to cry'; Fankhauser 1911: 328; Jeanjaquet 1931). An open issue in this respect is whether [pθ] has emerged from [pç] through the pathway [pʎ] > [pj] > [pç] > [pθ] > [pf] (Hasselrot 1937) and [pð] from [pʎ]

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through [pʎ] > [pð] > [pf] (Haberli 1908: 37; Dietrich 1945: 57), the two phonetic developments being in principle possible in view of the existence of their intermediate phonetic forms (see Figure 3a). While constriction fronting may account for a change [ç] > [θ], the replacement of [ʎ] by [ð] could be triggered by an increase in airflow rendering a purely alveolar variant of [ʎ] a front lingual fricative in a similar fashion to the substitution of [ʎ] by [ʒ] in Argentinian Spanish (see §1). In support of the former pathway, there is the parallel replacement of [pj] from other origins by [pç] and later by [pθ] in Franco-Provençal, as exemplified by the forms ['pçɛra] and ['pθera] of PĔTRA 'stone' where the palatal glide of the rising diphthong *ie*, which emerged from Latin /ɛ/ (Ĕ) in stressed position, has been strengthened into [ç]. Also in Polish and Greek dialects the palatalized labial has yielded [pʃ] and [ps(ʲ)], while in Auvergnat Occitan it may be realized as [ps] as exemplified by [psjaʀ] PĔTRA (Dauzat 1938: 150–151; Recasens 2020: 152). In support of the source [pʎ] of [pð], on the other hand, the replacement of [ʎ] by [ð] occurs in Valaisan in other contextual conditions (see §3.2.2) and data from Franco-Provençal-speaking localities may be adduced where [pj] derived from /pl/ through [pʎ] has yielded more anterior phonetic outcomes than [pj] derived from other sources: [pç], [pθ] vs. [pj] in Champéry (['pθɛna] PLENA 'full, fem. sing.', ['pjɛra] PETRA 'stone') and [pθ], [pf] vs. [pç] in Collombey (['pθɛjna] PLENA, ['çɛra] PETRA) (Gauchat et al. 1925, entries 77, 242).

Glide reinforcement may also involve the occlusivization of [j] into [ɟ] followed by palatal stop devoicing and thus the final outcome [pc] (/pl/ > [pʎ] > [pj] > [pɟ] > [pc]). Even though the sequence [pc] derived from /pl/ is not found anywhere in Figure 3a, it needs to be assumed in order to account for [tʃ] in Provençal and Ligurian and in zones of S. Piedmont and N. Lombardy where the palatoalveolar affricate is likely to have emerged from the sequence [ptʃ], which is still available in some dialect areas: [ptʃen] in Ticinese, [tʃeŋ] for PLENU 'full, masc. sing.' in Piedmontese and Ligurian and [pʃe] PLENU 'full, masc. sing.' in Bergamasco and Bormio in the Brescia province (Rohlfs 1966: 253; Jaberg & Jud 1928–1940, map 1335). Additional support for the development [pj] > [pc] > [(p)tʃ] comes from Romance and non-Romance languages (see footnote 3 on the latter). Indeed, the outcomes [pc], [ptɕ], [c] and [tɕ] of /pʲ/ are found in Romanian dialects (['pcatrə], ['catrə], ['tɕatrə] PETRA 'stone'; Recasens 2020: 146–147) and analogous end products for /pj/ may be exemplified by the subjunctive forms of the verb SAPERE 'to know' in Lower Engadinian (['sapca] SAPIAT; Pult 1897: 109), Old Occitan ([ptʃ] in *sapcha*, [(t)ʃ] in *sacha* SAPIAM; Appel, 1918: 88) and Ligurian (['satʃa] SAPIAT; Rohlfs 1966: 400).

A quite unexpected scenario occurs in S. Italy where, as shown in Figures 1a and 3a, /pl/ and /kl/ merged into [k(:)j]/[c(:)] in S. Abbruzzi, S. Lazio and all regions further south, e.g., Neapolitan ['canə] PLANU 'flat, masc. sing.' and

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[cam'ma] CLAMARE 'to call' (Rohlfs 1966: 253). Moreover, as for [c] derived from /kl/, the (alveolo)palatal stop derived from /pl/ has given rise to the palatoalveolar affricate [tʃ] in Sicily (where it may have been deaffricated into [ʃ]) as well as in Lazio and Campania in the Italian Peninsula. Several explanatory hypotheses have been advocated in order to account for the replacement of the labial by the velar. According to Repetti and Tuttle (1987), [p(:)j] has changed into [k(:)j] since there is a "more compact, more nearly homorganic articulation" between the stop and [j] in [kj] than in [pj], while in Rohlfs' opinion (Rohlfs 1966: 253) [pʎ] became [kʎ] through some sort of partial regressive assimilation by which the laminodorsal gesture for the alveolopalatal lateral caused the preceding labial to become dorsal. These proposals have not been included as possible pathways in Table 3. In spite of the absence of the intermediate sequences [pc], [ptʃ] and [pʃ] in S. Italy and in agreement with other scholars (Millardet 1925; Barbato 2005), it seems more advisable to advocate as the point of departure analogous pathways to those for Romanian and N. Italy referred to above, i.e., [pj] > [pɟ] > [pc] > [c] > [tʃ] or perhaps [pʲ] > [c] > [tʃ]. At a later stage [c] would be categorized as the allophone [kj] of the phoneme /c/ by listeners (see end of §2). An important difference between the two pathways [pj] > [pɟ] > [pc] > [c] > [tʃ] and [pʲ] > [c] > [tʃ] is that, while the former may be accounted for on an articulatory basis, the identification of [pʲ] as [c] should be caused by acoustic similarity in view of the analogous (rising) F2 vowel transitions and spectral burst characteristics for palatalized labial and palatal stops (Ohala 1978).

Several pieces of data may be adduced in support of this interpretation. On the one hand, the same course of events could be advocated for the outcome [tʃ] of /pj/ in words like *siccia* SEPIA 'cuttlefish' (Calabrian, Salentino, Sicilian) and *accio* APIU 'celery' (Neapolitan) (Rohlfs 1966: 400). On the other hand, the coexistence of the realizations [kj]/[kç] and [c] of [pj] (/pl/), as in the case of [pju], [kçu] and [c:u] for *più* PLUS 'more' in Sicily, Apulia, Napoli in Campania and Scanno in Abruzzi (Jaberg & Jud 1928–1940, map 1665), may be accounted for assuming that [kj] is an allophone of the phoneme /c/ rather than a pathway [pj] > [kj] > [c]. Regarding Sicilian, Millardet (1925: 746–747, 752) stated indeed that the sequence [kj] in forms like ['kjaga] PLAGA 'plague' and ['kjanta] PLANTA 'plant' has been issued from /c/ through a secondary development and that the digraph *ch* available in Old Sicilian documents must have represented the palatal stop instead of the sequence [kj]. It also appears to be the case that the Old Neapolitan graphemic sequences *chi, ci* and *ch* (*chiazza, chazza* PLATEA 'square', *chiù, ciù* PLUS 'more', *chiovere* PLOVERE 'to rain'; Ledgeway 2009: 116–117) correspond not to [kj] proper, which could support a change [pj] > [kj], but to a phonetic realization [c] derived from [pj] or [pʲ]. Analogous graphemic notations have

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been used to represent the (alveolo)palatal stop realization of /pʲ/ in 18th–19th c. Romanian texts (*chiatra* for *piatră* 'stone', *kiept* for *piept* 'chest'; Ferro 2005). In sum, it is likely that south of Lazio and Abruzzi /kl/ and /pl/ merged at the stage [c], which was issued from via gestural blending in the case of /kl/ and via glide reinforcement or acoustic equivalence in the case of /pl/.

A pathway [pj] > [kj] > [c] > [tʃ] with the replacement of the labial by the velar perhaps at the stage [pʎ] has also been proposed for other dialect domains besides S. Italy where /pl/ has yielded an affricate consonant (Repetti & Tuttle 1987: 57, 99): Ligurian and Provençal from the Alpes-Maritimes region, Galician ([tʃoˈrar] PLORARE 'to cry') and Portuguese where [tʃ] changed later to [ʃ]. Also here the pathway [pʎ] > [pj] > [pc] > [ptʃ] > [tʃ] seems far more advisable in light of the cooccurrence of [pj] and [tʃ] and no trace of the presumed intermediate stage [kj] in some of these dialect domains (Castillon ['pjana] and Breil ['tʃana] for PLANA 'flat, fem. sing.' in the Alpes-Maritimes region; Dalbera 1994: 419) and of the phonetic outcomes for /pl/ in northern and southern Italy reported above.

4.1.2 *Labial stop lenition*

Analogously to /kl/, the word-initial end product [ʎ] in Spanish (['ʎano] PLANU 'flat, masc. sing.', ['ʎeno] PLENU 'full, masc. sing.') may be justified, assuming that the labial segment was deleted after being lenited perhaps in favorable conditions such as after the final vowel of the preceding word (see Figure 3a and Table 3). Along these lines, Torreblanca (1990) has proposed a pathway [pʎ] > *[ɸʎ] > [hʎ] > [ʎ] based on Old Spanish forms such as *hllantada/hlantada* for *plantada* PLANTATA 'planted' and the past form of PLICARE *hlegó* for *plegó* '(s)he folded'. Regarding Asturian, a double pathway for word-initial /pl/ needs to be advocated, i.e., the one just mentioned for Spanish in the case of [ʎ] in C./E. Asturian and the one enounced above for Galician and Portuguese in the case of the W. Asturian affricates (['tʃanu], ['tsanu] PLANU). The latter phonetic development (i.e., [pʎ] > [pj] > [pɟ] > [pc] > [ptʃ] > [tʃ]) may have also given rise to the postnasal affricate of the Spanish words *henchir* IMPLERE 'to fill' and *ancho* AMPLU 'wide' for the same reasons referred to for the end product [tʃ] of postnasal /kl/ in §3.1.2.

4.2 /bl/

As shown in Table 4, two major diachronic pathways for /bl/ may be identified, which in similar ways to /pl/ depart either from C2 vocalization (i.e., [bʎ] > [bj]) or from C1 weakening (i.e., [bʎ] > [βʎ]).

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Table 4. Diachronic pathways for word-initial /bl/

/bl/	> bʎ	> bj	> bʝ	> bð	> bv	
			> bʄ	> bdʒ, ɟ	> dʒ	
			> βj	> j		
		> bð	> bv			
		> βʎ	> ʎ	> j		
				> ɟ	> dʒ	
					> c	> tʃ

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4.2.1 *Lateral vocalization*

According to Figure 4a, the sequence [bʎ] generated through /l/ palatalization may be found, in addition to [bl] and the later outcome [bj], in essentially the same Galloromance regions showing [pl], [pʎ] and [pj] for /pl/ as well (e.g., Vaudois [bʎã], [bjã] BLANCU 'white, masc. sing.'; Gauchat et al. 1925, entry 464). Both [bʎ] and [bj] also occur in Ribagorçan Catalan. Also, in parallel to /pl/, there is a clear prevalence of [bj] over [bʎ] everywhere, i.e., the presence of the more articulatorily unstable sequence [bʎ] implies that of [bj] while the reverse does not necessarily hold (there is [bj] but not [bʎ] in a number of French and Franco-Provençal dialects and in most of Italy).

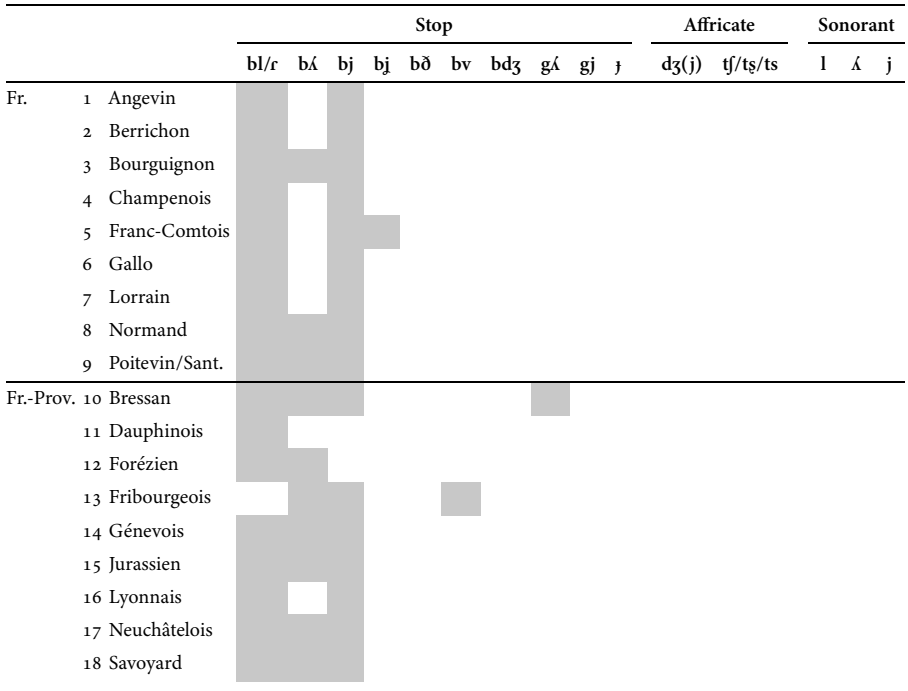

Figure 4a. *(continued)*

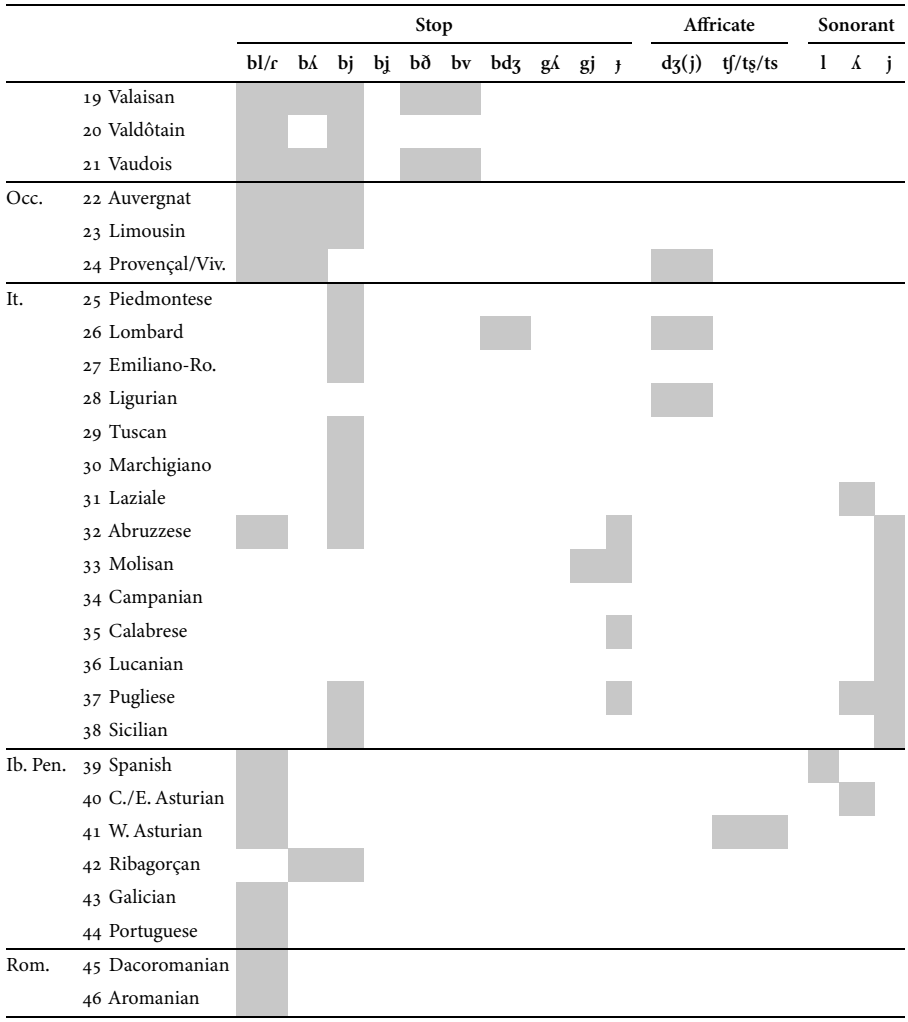

Figure 4a. Phonetic outcomes for word-initial /bl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur in Italy

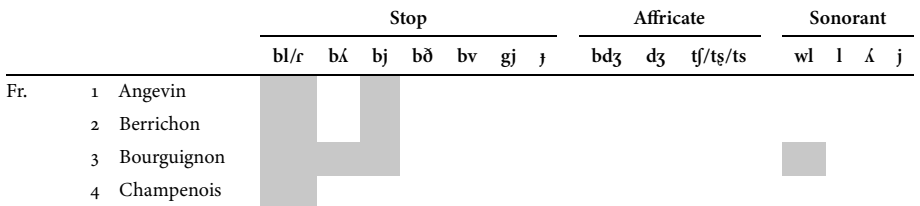

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Figure 4b. *(continued)*

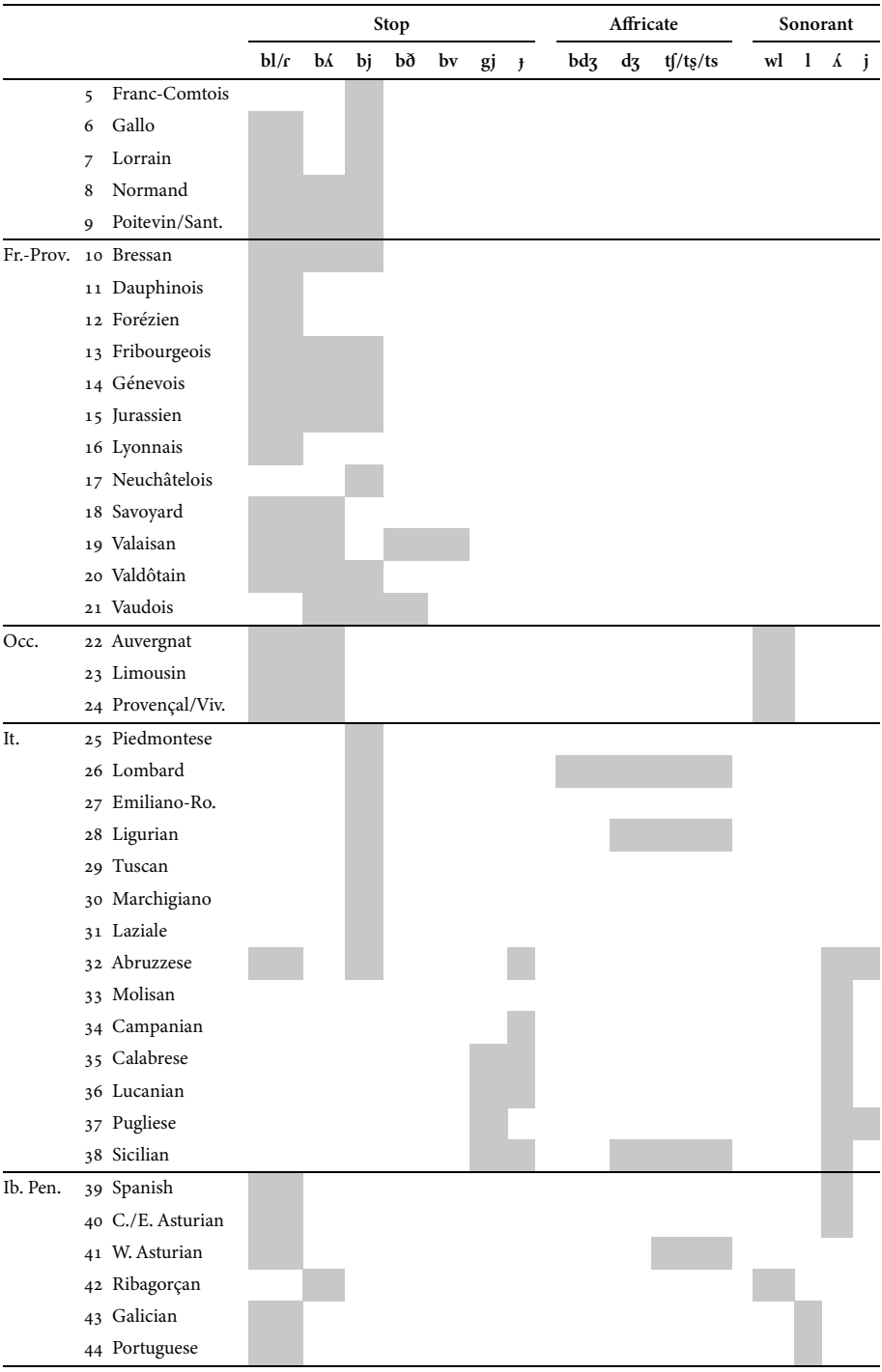

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Figure 4b. *(continued)*

		Stop							Affricate			Sonorant			
		bl/ɾ	bʎ	bj	bð	bv	gj	ɟ	bdʒ	dʒ	tʃ/tʂ/ts	wl	l	ʎ	j
Rom.	45 Dacoromanian														
	46 Aromanian														

Figure 4b. Phonetic outcomes for word-medial intervocalic /bl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur word-medial intervocalically in Italy

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In contrast with [pj] derived from /pl/, the phonetic data for /bl/ in Galloromance show practically no cases of glide reinforcement (the outcome [bʝ] is only available in Franc-Comtois). A reason for this may be that, while there may occur an increase in lingual constriction narrowing during the glide after /b/, the corresponding acoustic output may not be fricative-like enough to be categorized as [ʝ] by listeners in view of the lesser amount of airflow and the lower oral pressure level involved in the production of voiced vs. voiceless stops. In any case, /bl/ has yielded [bð] in Valais and Vaud and [bv] in Valais (Vaudois [bʎãˑ], [bjãˑ], [bðãˑ], Valaisan [bʎãˑ], [bðãˑ], [bvãˑ] for BLANCU 'white'; Gauchat et al. 1925, entry 464), the corresponding phonetic pathways available in Table 4 being analogous to those proposed for [pθ] and [pf] derived from /pl/ in Table 3, i.e., [bʎ] > [bð] > [bv] (Haberli 1908: 37; Dietrich 1945: 58) and [bʎ] > [bj] > [bʝ] > [bð] > [bv] (Hasselrot 1937), with therefore the dental fricative arising from either [ʎ] or [ʝ].

Glide occlusivization yielding [bɟ] appears to be required in order to handle the outcomes [bdʒ] and [dʒ] in N. Italy (Valtellina and Ticinese [bdʒaŋk], [dʒaŋk], Ligurian ['dʒaŋku BLANCU) and [dʒ] in E. Provençal (Merlo 1951: 1379; Rohlfs 1966: 241). The corresponding diachronic development could be [bʎ] > [bj] > [bɟ] > [bdʒ] > [dʒ], which parallels [pʎ] > [pj] > [pc] > [ptʃ] > [tʃ] (see §4.1.1) and also applies to [bj] derived from /bj/ in Rhaetoromance dialects (Sutselvan ['rapca], ['ravdʒa] RABIA 'rage', Lower Engadinian ['rabdʒa]; Pult 1897: 108; Luzi 1904: 818). Other phonetic pathways have been advocated for [dʒ] in Ligurian (Repetti & Tuttle 1997: 107). On the one hand, [bj] > [gj] > [ɟ] > [dʒ], which involves merging between [bj] (/bl/) and [gj] (/gl/) and has not been included in Table 4 for reasons argued for in §4.1.1. On the other hand, [βʎ] > [ʎ] > [j] > [ɟ] > [dʒ] word-medial intervocalically, which appears to be needed in order to handle the outcomes [j] and [dʒ] of /bj/ and /lj/ (Old Ligurian ['zoja] and present-day Ligurian ['dzodʒa] IOVIA 'Thursday', ['paja], ['padʒa] PALEA); as argued for /kl/ in Italy (§3.3), the string of sound changes [βʎ] > [ʎ] > [j] > [ɟ] > [dʒ] could be split into [βʎ] > [ʎ] > [ɟ] > [dʒ] and [βʎ] > [ʎ] > [j].

4.2.2 *Labial stop lenition*

The cluster /bl/ has also undergone a number of sound changes in S. Italy, which need to be analyzed in conjunction with /gl/ and /lj/ and are summarized in Table 5 (see Tuttle 1975 for details). In Marche and N. Abruzzi, /gl/ and /lj/ but not /bl/ have yielded [j] (['jan:ə] GLANDE, ['blaŋgə]/['bjaŋgə] BLANCU 'white, masc. sing.', ['fij:ə] FILIU 'son'). South of these dialect domains, /bl/, /gl/ and /lj/ have merged into [ʎ] (which may have been later replaced by [j]) or into [ɟ] word-medially; thus, there is ['stɾeʎa] STRIGILA 'curry comb', ['neʎa] NEBULA 'fog' and ['fiʎo] ALIU 'garlic' in Cilento, and the corresponding variants ['stɾija], ['nija] and ['fiju] in Lecce and ['stɾiɟ:a], ['neɟ:a] and ['fiɟ:u] in S. Calabrian.[8] Word-initially, /gl/ has generally yielded those same consonantal outcomes [ʎ], [j] and [ɟ] while there is essentially [j] for /bl/, which may be reinforced into [ɟ(:)] by "radoppiamento fonosintattico", a phonetic process consisting of the lengthening of a word initial consonant after a stressed vowel and certain morphological particles for the most part (['jaŋkə] BLANCU 'white, masc. sing.'/[ɛ ˈɟ:aŋkə] 'it is white'). Moreover, an outcome [ʎ] of word-initial /bl/ not shown in Table 5 is available in S. Apulia where ['jaŋgə], ['ɟ:aŋgə] and ['ʎaŋku] may be found (Jaberg & Jud 1928–1940, map 1575).

Different diachronic developments involving stop lenition and deletion and matching those for /gl/ in many respects (§3.2.2) have been proposed to account for the end products [ʎ]/[j] and [ɟ] of /bl/ in S. Italy. Concerning the pathway [βʎ] > [ʎ] > [j] > [ɟ:] (Tuttle 1975: 419) it is hard to understand why /bl/ has yielded [j] word-initially and the stronger outcome [ɟ:] in the weaker word-medial position and also why [ʎ] occurs in the latter position and only marginally in the former one. It may be that while [βʎ] > [ʎ] > [ɟ:] took place word-medially a pathway /bl/ > [bʎ] > [bj] > [βj] > [j] operated word-initially (see Table 4; and Rohlfs 1966: 241, 348 for a similar approach) in line with the weakening effect induced by a preceding word-final vowel on the bilabial stop in combination with the difficulty involved in coproducing the closing gesture for C1=[b] and the lingual gesture for C2=[ʎ].[9]

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8. The phonetic outcomes of word-medial /bl/ differ in some respects from those for /bj/, which has yielded essentially [d:ʒ] issued from [ɟ] (< [bɟ]) in S. Italy, except for the Lazio-Abruzzo area where the vocalized end product [j] of the (alveolo)palatal stop occurs (e.g., ['rad:ʒa], ['raja] RABIA 'rage'; Rohlfs 1966: 386–387).

9. An alternative pathway /bl/ > [bʎ] > [gʎ] > [g:j], [ɟ:] > [j] has been formulated by Loporcaro (1988: 93–99, 128–129), with [g:j] or [ɟ:] occurring word-medially and [j] word-initially, based on the existence of forms like ['nig:j] NIBULU 'kite' and [affəg'gjɛ] Italian *affibbiare* 'to buckle' derived from FIBULA with thus [g:j] instead of [b:j]. In my opinion, the direct replacement of the labial by the velar looks unsuitable for the same reasons argued for the pathway /pl/ > [pj] > [kj] > [c] > [tʃ] in §4.1.1.

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Table 5. Phonetic outcomes for /bl/ compared to those for /gl/ and /lj/ in S. Italy

	Word-initially		Word-medial intervocalically		
	bl	***gl***	***bl***	***gl***	***lj***
Marche	bj	j	b:j	j	j
N. Abruzzi	bj	j	b:j	j:	j:
Campania, Lucania, N./C. Calabria	j	ʎ(:)	ʎ(:)	ʎ(:)	ʎ(:)
S. Calabria, Lucania, Apulia, Sicily	j	ɟ:	ɟ:	ɟ:	ɟ:
Apulia	j	j (ɲ)	ɟ:	ɟ:	ɟ:

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Figure 4a also reveals that, analogously to /gl/ (§3.2), in Spanish /bl/ has stayed as such or has been simplified into [l] after being lenited into [βl] in the word-initial position (*blanco* Germanic BLANK, *blando* BLANDU, *lastimar* BLASPHEMARE 'to hurt'). Word-medially, on the other hand, the labial cluster has stayed unmodified or has changed into [ʎ] through the intermediate sequence [βʎ] (*niebla* NEBULA 'fog', *trillo* TRIBULU 'threshing machine'). In Asturian, the development of word-initial /bl/ into [ʎ] in the central/eastern dialect and into an affricate in the western dialect (e.g., [ʎastiˈmaɾ], [tsastiˈmaɾ]; Álvarez 1949; García Arias 2003: 215) could parallel that for /gl/ in the same word position and thus involve two possible pathways with the initial stages [βʎ] or [l] (see §3.2.2).

5. Sequence /fl/

In parallel to the stop clusters, and as shown in Table 6, two major diachronic pathways may be identified for the cluster /fl/ in Romance, which start out, respectively, with the vocalization of the alveolopalatal lateral yielding [fj] and a change in the labiodental fricative giving rise to the sequences [çʎ] or [ɸʎ] through lenition or to [vʎ] through voicing. Moreover, a comparison between Figures 5a and 5b reveals the existence of very similar phonetic outcomes word-initially and word-medial intervocalically with some exceptions.

5.1 Lateral vocalization

The sequence [fʎ] often shifts to [fj] through vocalization of the alveolopalatal lateral in French, most of Franco-Provençal, Auvergnat Occitan, Italy and Ribagorçan Catalan (Norman [fʎam], [fjam] FLAMMA 'flame'; de Guer 1899) after which several glide reinforcement strategies may occur yielding the phonetic outcomes displayed in the three upper rows of Table 6.

Table 6. Diachronic pathways for word-initial /fl/

/fl/	> fʎ	> fj	> fç	> fʃ	> ʃ
				> ç	> ʃ, j
			> c	> tʃ	> ʃ
		> çʎ	> ç(j)	> ʃ(j), s(j), θ, j	
			> θʎ	> θ	
			> ʎ	> j	
		> vʎ/ɸʎ	> ʎ		

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Firstly, [fj] may be reinforced into [fç] through an increase in glide constriction narrowing after which [fç] may shift to [fʃ]. The sequence [fç] may be found in Franc-Comtois and [fʃ] in N. Lombard areas where /pl bl/ are also implemented as [ptʃ bdʒ] (§4.1.1 and §4.2.1), while in Ligurian [fʃ] has been simplified into [ʃ] also intervocalically (['ʃua] FLORE 'flower', [sy'ʃa] SUFFLARE 'to blow'; Rohlfs 1966: 247, 352). Analogous sound changes have operated on [fʲ] and [fj] from other etymological sources in Romance and non-Romance languages (Recasens 2020: 159–163): in Romanian yielding [fç ç ɕ ʃ s/sj], as exemplified by [fçer], [çer] FĔRRU 'iron' where the palatal glide of the diphthong [jɛ] derived from /ɛ/ (Ĕ) has been strengthened into [ç]; in Auvergnat Occitan where we find forms like [fθe̯a] FERRU 'iron' and [fsjaw] FILU 'thread' issued from [fe̯ar] and [fjaw], respectively (Dauzat 1938: 148, 1955); in Greek and Polish where /fʲ/ has evolved into [fʃ fs] and [fɕ fç ɕ ç], respectively. Differences in constriction degree and in the aerodynamic requirements involved in the production of the two consonant types explain why the glide is likely to be reinforced into a stop or an affricate after the stops /p b/ and into a fricative after /f/: a narrower constriction and a higher intraoral pressure buildup for the stop than for the fricative is more prone to cause the formation of a complete closure during the temporal period allocated to the following glide (Ohala & Solé 2010).

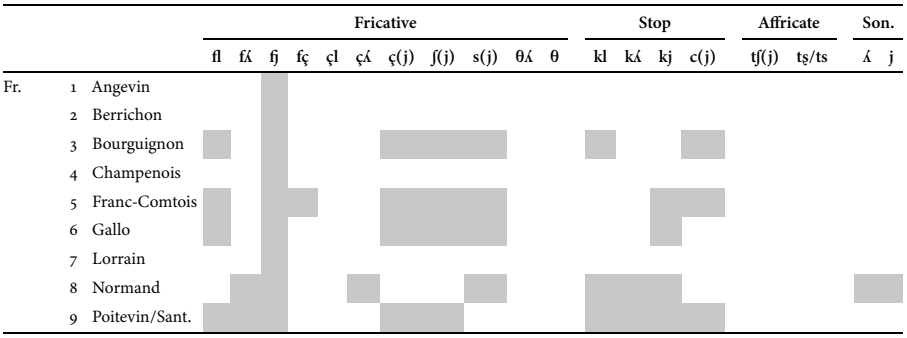

Figure 5a. *(continued)*

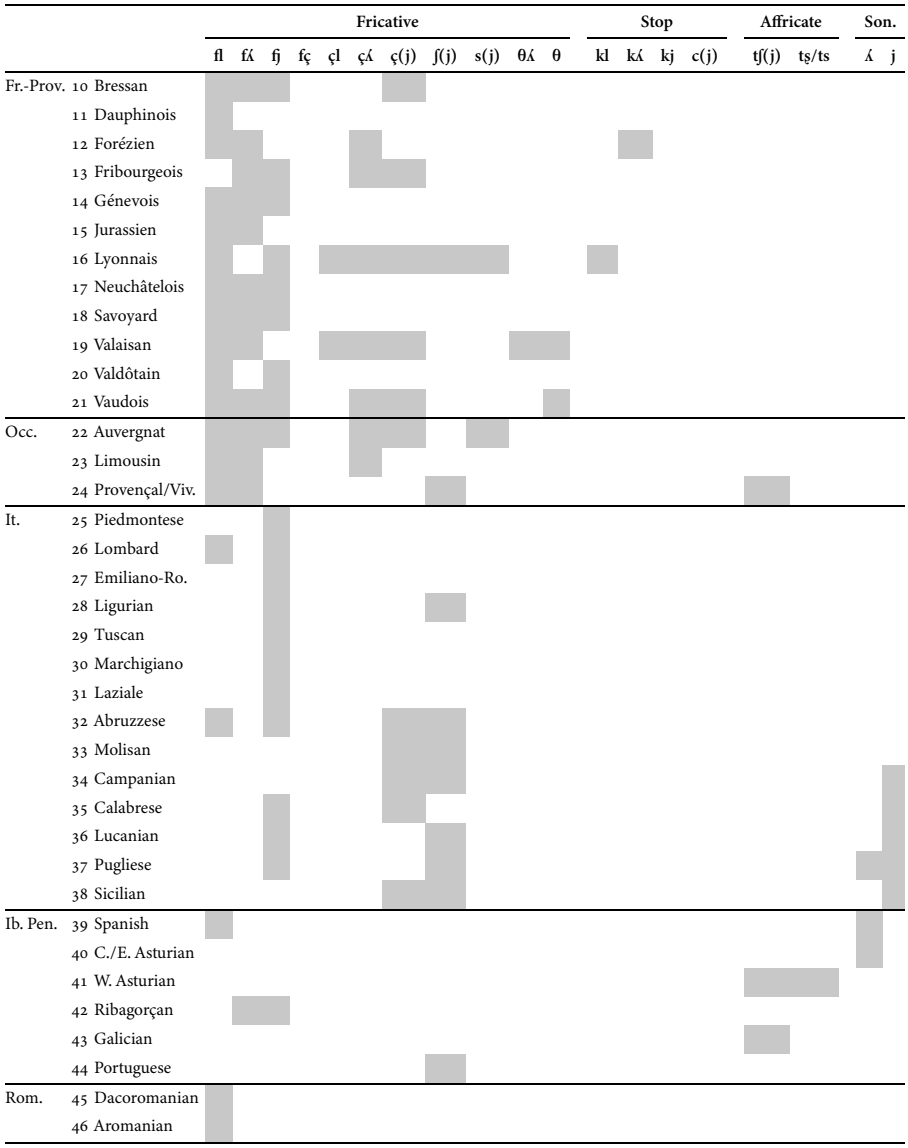

Figure 5a. Phonetic outcomes for word-initial /fl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur in Italy

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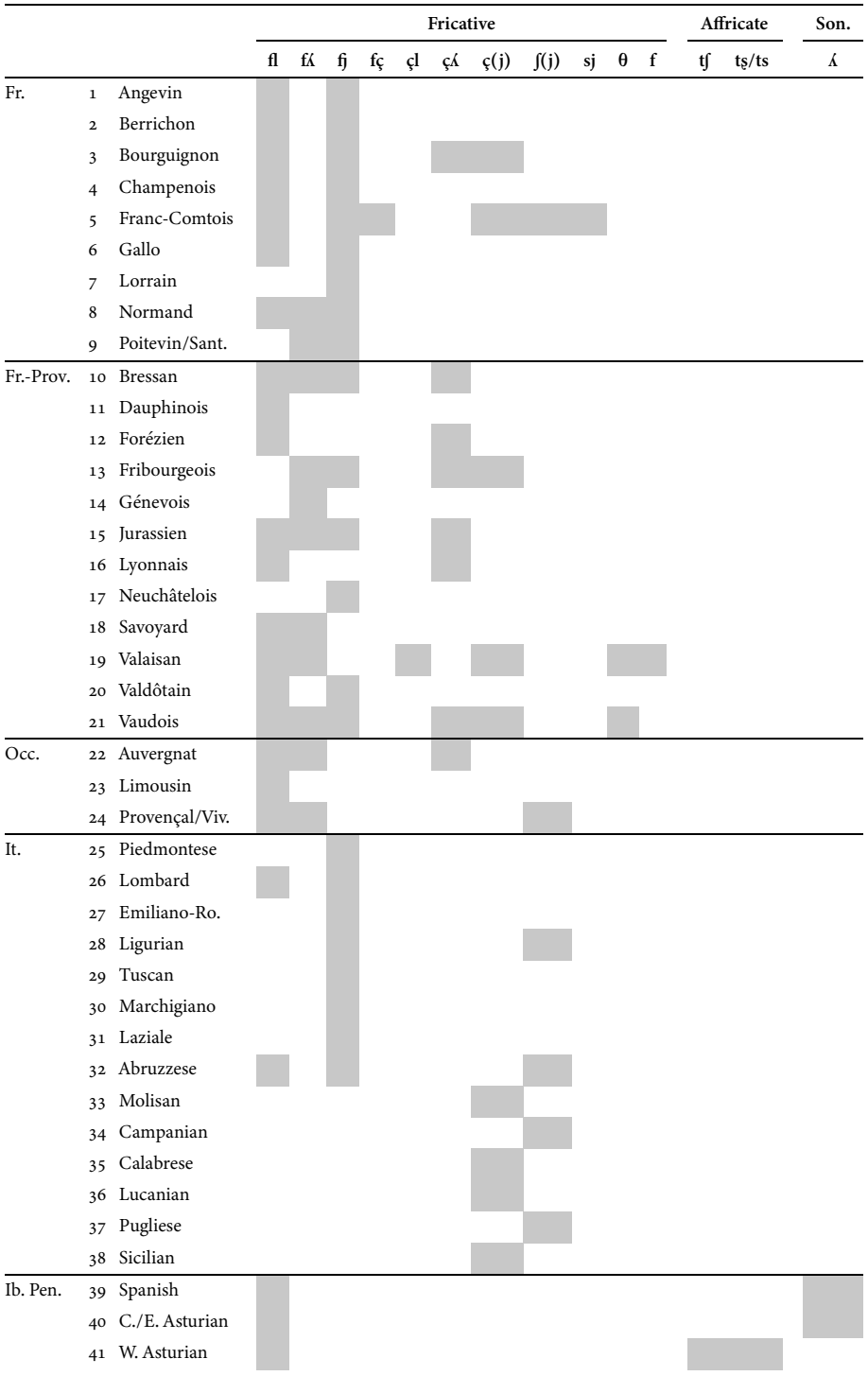

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Figure 5b. *(continued)*

		Fricative										Affricate		Son.
		fl	fʎ	fj	fç	ɕl	ɕʎ	ɕ(j)	ʃ(j)	sj	θ	f	tʃ	tʂ/ts	ʎ
	42 Ribagorçan														
	43 Galician														
	44 Portuguese														
Rom.	45 Dacoromanian														
	46 Aromanian														

Figure 5b. Phonetic outcomes for word-medial intervocalic /fl/ in Romance dialects grouped according to manner of articulation and language domain. The phonetic symbols do not account for instances of consonant lengthening which may occur word-medial intervocalically in Italy

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Another pathway has given rise to the affricate end product [tʃ] of the cluster /fl/ in Provençal from the Alpes-Maritimes region and Galician and also in Portuguese where it has been deaffricated into [ʃ] (Galician [ˈtʃeo] PLENU 'full, masc. sing.', [aˈtʃar] AFFLARE 'to find', Portuguese [ˈʃeju], [ɐˈʃar]). The argumentation about the corresponding phonetic development is analogous to that proposed for the cluster /pl/ in §4.1.1. In principle one would be tempted to propose a derivation [fʎ] > [kʎ] > [kj] > [c] > [tʃ] or else [fʎ] > [fj] > [kj] > [c] > [tʃ] all the more so since in this particular case and as also shown in Figure 5a the outcomes [kʎ], [kj] and [c(j)] of /fl/ are available in French dialects such as Bourguignon, Franc-Comtois, Gallo, Normand and Poitevin/Santongeais (Poitevin [kʎo]/[kʎɑ], [kjo]/[kjɑ] FLAGELLU 'scourge'; Pignon 1960: 396). The motivation for this sound change instead lies in the perceptual integration of a palatalized realization of /f/ as the allophone [c] of /kj/ issued perhaps through an intermediate stage [fc] also available in Greek and Romanian dialects (Recasens 2020: 157–159). Also in S. Italy, palatalized /f/ or the sequence /fj/ has been reinforced into a palatal stop in segmental contexts such as after a nasal stop consonant which enhance their dorsopalatal component. This contextual effect may be exemplified by the following forms: Sicilian [uɲˈcatu] and [uɲˈɟuɾi] derived from CONFLATU 'melted' and FLORE 'flower' preceded by the indefinite article *un*; [ɲˈcaɾe] INFLARE 'to fill' and [skuɲˈcaɾi] EXCONFLARE available in S. Apulia (Ribezzo 1912: 59); [unˈɟaɾe] UNFLARE occurring in Calabria (Rensch 1964: 144); the widespread lexical variant [acˈca] of AFFLARE 'to find' where gemination appears to have had a similar effect to that of a preceding nasal stop (Tuttle 1975: 422; Millardet 1925: 746). Likewise, there is [iɲˈtʃaɾ] INFLARE in Spanish.

5.2 Fricative lenition

In Galloromance, the labiodental fricative may shift to [ç] through a change in place of articulation already at the stage /fl/ thus yielding [çl], an outcome which occurs in dialects 16 and 19 of Figure 5a and has not been included in Table 6. In essentially the same French-, Franco-Provençal- and Occitan-speaking domains where /kl/ has developed into [çʎ] and [ç(j)], the table shows that [fʎ] has been replaced by [çʎ] and later by [çj] and [ç] (Vaudois [fʎama], [çʎãma], [çjãma] FLAMMA 'flame'; Gauchat et al. 1925, entry 352; Hasselrot 1937: 151). In partial disagreement with Dauzat (1938: 153) and Gardette (1941: 80), it seems that the replacement of [fʎ] by [çʎ] should not be attributed exclusively to the high frequency of occurrence of [çʎ]/[çj] derived from /kl/ in a given dialect region. There may be an articulatory motive for this sound change, namely, an increase in dorsopalatal contact size exerted by [ʎ] on preceding [f] causing the labiodental fricative to become [ç]-like and thus to acquire a spectral peak frequency at about 4000–5000 Hz.

A number of articulation-based sound changes may operate on the outcomes [çʎ] and [ç(j)] of /fl/ (see the four lower rows of Table 6). On the one hand, [ç(j)] may front to [ʃ(j)] and [s(j)] in essentially the same Galloromance dialects where these two consonantal sequences arise from [ç(j)] derived from /kl/ (see 3, 5, 6, 8, 9, 16, 22 and 24 in Figure 5a), as exemplified by Franc-Comtois [çy çø], [ʃwe ʃu] and [sju] FLORE 'flower' (Dondaine 1972–1991, map 520). On the other hand, [çʎ] may be simplified into [ʎ] and the (alveolo)palatal lateral may then vocalize into [j] (Norman [fʎam], [fjam], [ʎãb], [jãb] FLAMMA 'flame'; de Guer 1899: 49–52). Another front lingual outcome is [θ] in Vaud and Valais (['θãma] FLAMMA) for which the most likely derivations included in Table 6 are [fʎ] > [çʎ] > [θʎ] > [θ] and [fʎ] > [çʎ] > [ç] > [θ] in view of the fact that their intermediate phonetic realizations occur in the region, i.e., ['çʎãma], ['ç(j)ãma] in Valais and Vaud and ['θʎãma] in the Valaisan-speaking localities Grimentz and Ormont-Dessous (Haberli 1908: 24, 39; Gauchat et al. 1925, entry 352; Dietrich 1945: 55). As shown in Figure 5b, comparable sound changes have operated word-medial intervocalically; thus SUFFLARE 'to blow' has yielded [su'fle], [su'fje] in Lorrain and [ʃo'fja], [ʃo'çʎa] and [ʃo'θa] in Swiss Franco-Provençal (Gilliéron & Edmont 1902–1910, map 1249).

The diachronic analysis for /fl/ in S. Italy (and thus in Apulia, Lucania, Calabria, Campania and Sicily) is less straightforward. In this region, /fl/ has yielded [j], [ç] and [ʃ] word-initially and [ç] and [ʃ] word-medially, with specific geographical areas favoring one fricative over the other one, e.g., [ʃ] in Campania and [ç] in Calabria. Here are some exemplifying lexical forms: (word-initially) Cilentian ['jam:a] for FLAMMA 'flame', and Leccese ['juɾu], Lucanian ['ʃorə], Calabrian

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['çuɾe] and Sicilian ['çuɾi], ['ʃuɾi] for FLORE 'flower'; (word-medially) Campanian [ʃuʃ'ʃa], Calabrian [çuç'ça] and Sicilian [çuç'çaɾi], [ʃuʃ'ʃaɾi] for SUFFLARE 'to blow' (Melillo 1926; Jaberg & Jud 1928–1940, maps 936, 1357; Rensch 1964). The same as for /bl/, an outcome [ʎ] may occur for word-initial /fl/ only in S. Apulia (['ʎaŋku] BLANCU 'white', ['ʎetta] FLECTA from FLECTERE 'to bend'). To account for these data and assuming that [fj] has been issued from [fʎ], the following pathways included in Table 6 are proposed:

a. [fʎ] > [fj] > [fç] > [ç] > [ʃ], [j], which involves the reinforcement of [j] into [ç];
b. [fʎ] > [çʎ] > [ç(j)] > [ʃ], [j], which involves the weakening of [f] into [ç];
c. [fʎ] > [vʎ] > [ʎ] > [j] > [ç] > [ʃ], which parallels other pathways involving C1 lenition such as [gʎ] > [ɣʎ] > [ʎ]/[j] and [bʎ] > [βʎ] > [ʎ]/[j] (Tuttle 1975: 430; Ledgeway 2009: 117).

Given that the outcome [ʎ] of /fl/ is not available except for Apulian, one is inclined to favor the pathway (a) and perhaps (b) over (c). Moreover, an analogous development to pathway (a), i.e., [pj] > [pc] > [c] or [pʲ] > [c], has also been proposed for /pl/ (§4.1.1) and judging from the phonetic outcomes for word-initial /kl/ in Galloromance the sound change [ç(j)] > [ʃ], [j] available in (a) and (b) looks more natural than the reverse development [j] > [ç] > [ʃ] available in (c).

The weakening of the labiodental fricative favored presumably by the preceding phonetic segment has contributed to the outcome [ʎ] of /fl/ in Spanish both word-initially and word-medially (['ʎama] FLAMMA 'flame', [a'ʎar] AFFLARE), the two pathways [fʎ] > [çʎ]/[vʎ] > [ʎ] and [fʎ] > [ɸʎ] > [hʎ] > [ʎ] being in principle possible (see Torreblanca 1990). As for Asturian, two separate derivations could be advocated, namely, the one just mentioned for Spanish in the case of C./E. Asturian (['ʎama] FLAMMA, [so'ʎar] SUFFLARE 'to blow'; García Arias 2003: 224) and that for Galician and Portuguese advocated in §5.1 in the case of W. Asturian (['ʈʂama], ['tʃama] FLAMMA).

6. Summary and discussion

The diachronic developments and sound change mechanisms operating on the syllable-onset clusters /kl gl pl bl fl/ in Romance conform to several patterns summarized next.

It has been assumed that /l/ palatalization into [ʎ] yielding [Cʎ] is at the origin of later sound changes even in dialect domains where [Cʎ] is absent based on, among other factors, the presence of the outcome [ʎ] of /gl/ across word positions and of /kl/ intervocalically in most dialect areas subjected to investigation. Several pieces of data support the hypothesis that /l/ palatalization into [ʎ] has

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arisen through a blending mechanism involving the tongue dorsum gesture for the velar stop and the tongue front gesture for the alveolar lateral though other explanations such as the one proposed by Müller (2011) should not be discarded. Thus, this palatalization process may have operated only on /Cl/ clusters with velar consonants whether independently of word position as in Romanian or only word-medial intervocalically as in French, Occitan and Catalan. Moreover, in so far as blending may occur in sequences with [k g] but not in those with [p b f], the change /Cl/ > [Cʎ] must have extended from the former to the latter perhaps through analogical spread while /kl gl/ exhibited both unpalatalized and palatalized variants as they still do nowadays in many Galloromance-speaking areas (see Figure 1a). [Cʎ] sequences with consonants of all places of articulation are found essentially in Galloromance including Occitan and also in Ribagorçan Catalan.

A relevant characteristic of the [Cʎ] sequences in question is their articulatory instability, which may be resolved by vocalizing the postconsonantal alveolopalatal lateral into [j] (also after C1 has been lenited, as for example in the case [çʎ] > [çj]). [Cj] sequences issued from this vocalization process are more spread geographically than the [Cʎ] ones. Thus, for example, while the two sequence structures cooccur in Galloromance and Ribagorçan, the former but not the latter are found in Italy.

Several major sound change patterns have operated on the [Cʎ] and [Cj] sequences of interest.

In the first place, there has been either gestural blending or glide reinforcement in [Cj] sequences arisen from [Cʎ]. This blending process has taken place in [Cj] sequences with a velar stop where the production of the two consecutive consonants involves the activation of the dorsum of the tongue, thus giving rise to the palatal stops [c] and [ɟ] in Galloromance, Italy and Romanian, which in their turn may change to an affricate if voiceless ([c] > [tʃ]) and to an affricate or to [j] if voiced ([ɟ] > [dʒ], [j]). The resulting affricates are found, for example, in N./S. Italy ([c tʃ] /kl/, [ɟ dʒ] /gl/) and in W. Asturian and Galician/Portuguese ([tʃ] /kl/). Glide reinforcement, on the other hand, has occurred in [Cj] sequences with labial or labiodentals where the two consonants are produced with the relatively independent lip and tongue dorsum articulators. This reinforcement process may yield an (alveolo)palatal stop and subsequently an affricate after a bilabial stop (N. Italy /pl/ [(p)tʃ], /bl/ [(b)dʒ]) and a fricative after /f/ ([fç] Franc-Comtois, [fʃ] N. Italy). The precise implementation of this glide strengthening process may also depend on the C1 voicing status: /pl/ may be realized as [pç] in Franco-Provençal-speaking localities where the phonetic outcome of /bl/ is [bj]; /pl/ but not /bl/ has yielded a palatoalveolar affricate word-initially in S. Italy, Old Portuguese and Galician.

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Another sound change mechanism involves C1 lenition, which operates typically on velar stops (also on [f]; see below) rather than on labial stops yielding the also unstable sequences [çʎ] (< [kʎ]) and [ɣʎ] (< [gʎ]). In the case of velar stop clusters, C1 lenition is associated with the nearly homorganic relationship between C1 and C2 in the sequences [kʎ] and [gʎ] and also with the fact that during the articulation of these consonantal sequences the dorsal closure for the velar may be incomplete. Moreover, C1 lenition often followed by deletion yielding [ʎ] (and later [j]) operates on stops which are etymologically voiced or have been converted to voiced if originally voiceless, which is in line with differences in tongue dorsum contact and intraoral pressure between stops differing in voicing. This consonant voicing effect is often associated with word position such that, analogously to the standard French, Occitan and Catalan cases referred to above, the final phonetic outcomes of /kl gl/ turn out to be weaker word-medial intervocalically than word-initially. This is the case in many Galloromance regions where /kl/ is implemented as a two-consonant sequence or as an obstruent word-initially ([kʎ]/[gʎ], [kj]/[gj], [c]/[ɟ], [tʃ]/[dʒ], [ç]/[ʃ]/[ʒ]) and only barely so word-medially where the velar stop often drops after shifting to a voiced approximant ([ɣʎ] > [ʎ] > [j]). This word-position dependent effect is however not always at work. In C. and S. Italy, /kl/ is realized as [kj] or [c] in the two word positions since there has been no stop voicing word-medial intervocalically while /gl/ (and to a large extent /bl/ in S. Italy as well) has been simplified into [ʎ]/[j] not only word-medially but also word initially through stop lenition exerted presumably by the preceding word-final phonetic segment. An analogous situation holds in the Iberian Peninsula where the outcome [ʎ] has occurred for most clusters in the two word positions in Old Spanish and C./E. Asturian.

The present study has also revealed a number of unusual sound changes and phonetic pathways, which are summarized next.

The alveolopalatal lateral [ʎ] may have been replaced by both [ɟ] and dental fricatives in velar and bilabial clusters alike. On the one hand, the replacement of [ʎ] by [ɟ] is achieved through an increase in dorsopalatal contact area and appears to have occurred in Italy (for /gl/ and /bl/ across word positions) and in W. Asturian (for the word-medial velar clusters). On the other hand, the replacement of [ʎ] by [ð], which has taken place for /gl/ in the Franco-Provençal variety from Vaud and Valais, appears to obey some constriction fronting and a decrease in tongue-to-palate contact during the (alveolo)palatal lateral. A complication is that dental fricatives may arise not only from [ʎ] but also from [ç] through tongue constriction fronting. An interesting issue left for further research in this respect is whether, as assumed in the present study, the dental fricatives in question have emerged from C1=[ç] in the case of the clusters /kl fl/ ([çʎ] > [θʎ]; [çj] > [θj]) and

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from both C2=[ʎ] and C2=[ç], [ʝ] in the case of the bilabial clusters ([pʎ] > [pð]; [pç] > [pθ]; [bʎ bʝ] > [bð]).

Another difficult case is why word-initial /pl/ has yielded analogous phonetic outcomes to /kl/ in S. Italy ([c], [tʃ]) as well as in Portuguese, Galician and W. Asturian ([tʃ]). Based on phonetic and graphemic data, it was argued that this sound change may be accounted for assuming a more or less palatalized labial realization as the point of departure rather than positing a replacement of the bilabial by the velar. In the former event, a reconstructed pathway for S. Italy would be [pʲ] > ([pc]) > [c] > [k(:)j], [(t)ʃ].

The development of /fl/ turns out to be also problematic in other respects. Firstly, there is the issue as to whether C1 lenition in the sequence [fʎ] has yielded [çʎ], [vʎ] or [ɸʎ], the sequence [ɸʎ] having been proposed for [ʎ] in Spanish and [çʎ] for [ç ʃ, s] in Galloromance, [ç ʃ] in S. Italy and [θ] in Franco-Provençal. The replacement of [fʎ] by [çʎ] may be associated with the anticipatory tongue dorsum raising effect exerted by the alveolopalatal lateral on the preceding labiodental fricative. On the other hand, it is not always clear whether the end product [ç] of /fl/ (later [ʃ]), as for example in S. Italy, has emerged through the pathways [fʎ] > [fj] > [fç] > [ç] or [fʎ] > [çʎ] > [ç(j)] and thus glide reinforcement in the former pathway and C1 lenition in the latter. Another controversial issue concerns the outcome [tʃ] of /fl/ in French dialects, Alpes-Maritimes, Galician, Portuguese and W. Asturian, which, analogously to the /pl/ case referred to above, is likely to have arisen from a palatalized labiodental fricative realization rather than through the substitution of [f] by [k] at the [fj] or [fʎ] stages.

In terms of the articulatory or acoustico-perceptual basis of the sound changes, most of these have been argued to have an articulatory rather than an acoustico-perceptual motivation. This is the case for instances of vocalization (e.g., [ʎ] > [j]), gestural blending (e.g., [kj] > [c]), glide constriction narrowing (e.g., [pj] > [pç], [pc]), fricative constriction fronting (e.g., [pç] > [pʃ]), stop affrication (e.g., [pc] > [ptʃ]), cluster simplification (e.g., [pc] > [ptʃ] > [tʃ] > [ʃ]), obstruent lenition (e.g., [kʎ] > [çʎ]) as well the replacement of [ʎ] by [ɟ] and [ð]. At least two possible candidates for an acoustic-perceptual account have been identified: the replacement of [θ] by [f] (see §3.1.2) and of palatalized labials by palatals and thus of [pʲ] by [c] (§4.1.1). Regarding the one-to-many derivation problem, a given consonantal sound has been shown to emerge from a common etymological source through several developments Thus, for example, /kl/ has yielded [ʃ] through /kl/ > [kʎ] > [kj] > [c] > [tʃ] > [ʃ] and /kl/ > [kʎ] > [çʎ] > [çj] > [ʃ(j)], and both /gl/ and /bl/ have yielded [ɟ] through the pathways /gl/ > [gʎ] > [gj] > [ɟ] and /bl/ > [bʎ] > [bj] > [bɟ] > [ɟ], on the one hand, and /gl/ > [gʎ] > [ɣʎ] > [ʎ] > [ɟ] and /bl/ > [bʎ] > [βʎ] > [ʎ] > [ɟ], on the other hand.

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Abbreviations

C.	Central	Prov.	Provençal
E.	Eastern	Rom.	Romanian
Fr.	French	S.	Southern
Fr. Prov.	Franco-Provençal	W.	Western
Ib. Pen.	Iberian Peninsula	Emiliano-Ro.	Emiliano-Romagnol
It.	Italy	Poitevin/Sant.	Poitevin- Santongeais
N.	Northern	Provençal/Viv.	Provençal-Vivaro Alpin
Occ.	Occitan		

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Appendix

In addition to the cross-dialect study Repetti and Tuttle (1987), the dialect data reported in the present essay have been taken from the following bibliographical sources.

(French) General (Gilliéron & Edmont 1902–1912, maps 14 *aguille*, 135 *blanc*, 301 *clé*, 420 *double*, 478 *érable*, 579 *flamm*e, 647 la *glace*, 1038 *plomb*, 1249 *souffler*, 1273 *table*, 1355 *veiller*); Bourguignon (Régnier 1979; Taverdet, 1975–1980, 1980 maps 84 *glace*, 176 *clocher*, 476 *fléau*, 591 *clou*); Champenois (Bourcelot 1966–1978, maps 55 *clair*, 158 *cloches*, 610 *clou*); Franc-Comtois (Juret 1872; Jeker 1938; Dondaine 1972, 1972–1991, maps 70 *glace*, 114 *cloche*, 300 *glaner*, 425 *clou*, 520 *fleur*, 593 *souffler*, 904 *clé*, 942 *claire*); Gallo (Dottin & Langouët 1901; Chauveau 1984; Guillaume et al. 1975–1983, maps 38 *pluie*, 39 *blé*, 40 *clos*, 41 *glaner*, 42 *fléau*); Lorrain (Callais 1908; Brod 1912; Lahner et al. 1979–1988, maps 333 *plume*, 364 *clé*, 560 *blé*, 587 *fléau*); Normand (de Guer 1899; Brasseur 1980–1997, maps 98 *seigle*, 148 *glaner*, 156 *fléau*, 160 *glui*, 444 *glands*, 546 *pleuvoir*, 557 *clair*, 574 *éclairs*, 703 *plume*); Poitevin/Santongeais (Pignon 1960; La Chaussée 1966; Massignon & Horiot 1971–1983, maps 43 *blé*, 70 *glaner*, 77 *fléau*, 174 *planter*, 245 *clou*, 279 *fleur*).

(Franco-Provençal) General (Haberli 1908; Gauchat et al. 1925, entries 10 *pleut*, 41 *glace*, 74 *encoubler*, 94 *ferme* CLAUDIT, 103 *clef*, 125 *bouteille*, 144 *double*, 166 *blé*, 234 *clair*, 240 *plein*, 261 *gland*, 270 *plante*, 340 *pleure*, 352 *flamme*, 393 *blanche*, 423 *oreille*, 461 *plumes*); Bressan (Duraffour 1932); Dauphinois (Devaux 1935); Forézien (Gardette 1941); Fribourgeois (Haefelin 1879); Génevois (Keller 1919); Jurassien and Savoyard (Martin & Tuaillon 1971–1978, maps 19 *pluie*, 49 *glace*, 293 *le blé*, 331 *glaner*, 437 *fleurs*, 587 *clou*, 1053 *clé*, 1511 *cloche*); Lyonnais (Gardette 1950–1976, maps 44 *seigle*, 246 *clou*, 428 *glands*, 588 *flèn*e, 697 *clé*, 905 *cloche*); Neuchâtelois (Urtel 1897); Valaisan (Gilliéron 1880; Zimmerli 1899; Fankhauser 1911; Jeanjaquet 1931; Dietrich 1945; Bjerrome 1957); Valdôtain (Walser 1937; Keller 1958); Vaudois (Hasselrot 1937).

(Occitan) General (Gilliéron & Edmont 1902–1912, see maps above); Auvergnat (Dauzat 1938; Reichel 1991); Limousin (Rousselot 1891); Provençal/Vivaro-Alpin (Dalbera 1994).

(Ladin) Agordinian (Pellegrini 1954–1955); Fassan (Elwert 1943; Heilmann 1955).

(Italy) General (Jaberg & Jud 1928–1940, maps 365 *nebbia*, 366 *piovere*, 381 *ghiaccio*, 593 *ghianda*, 655 *veglia*, 675 *specchio*, 831 *doppio*, 889 *chiave*, 936 *soffiare*, 1212 *caglio*, 1242 *striglia*, 1357 *fiore*, 1362 *bietola*, 1369 *aglio*, 1575 *bianco*, Rohlfs 1966; Tuttle 1975; Barbato 2005); Piedmontese (Spoerri 1918; Nicolet 1929); Lombard (Merlo 1951); Abruzzese (Schlack 1966); Campanian (Ledgeway 2009); Calabrian (Rensch 1964; Mele & Schmid 2009); Lucanian (Lausberg 1939; Bigalke 1976); Apulian (Ribezzo 1912; Melillo 1926; Loporcaro 1988).

(Sassarese, Gallurese) Bottiglioni (1920); Blasco (1984).

(Corsican) Dalbera-Steffanaggi (1991).

(Iberian peninsula) Spanish (Menéndez Pidal 1968; Torreblanca 1990); Asturian (Álvarez 1949; Catalán 1956–1957; Fernández 1960; García Arias 1975, 2003); Ribagorçan Catalan (Veny & Pons 2001-…); Portuguese (Williams 1938).

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Zusammenfassung

Die vorliegende Untersuchung befasst sich mit der historischen Entwicklung der Silbenanlaute /kl gl pl bl fl/ in den romanischen Sprachen und Dialekten und mit deren artikulatorischen und/oder perzeptuellen Motivation. Ausgehend von artikulatorisch instabilen [Cʎ]-Sequenzen werden mehrere diachrone Entwicklungen identifiziert, vor allem in Form von Vokalisierung des Laterals (z. B. [kʎ] > [kj]) und Lenisierung des Obstruenten (z. B. [kʎ] > [çʎ]). Die meisten Lautveränderungen werden artikulatorischer Variation zugeschrieben, insofern sie Anpassungen in Grad und Ort der Verengung erfordern. In einigen Fällen scheint die Ersetzung eines Konsonanten durch akustisch-perzeptuelle Äquivalenz verursacht worden zu sein, wie beispielsweise die Ersetzung von [θ] durch [f] im Franko-provenzalischen und von palatalisierten labialen Verschlusslauten durch palatale Verschlusslaute in Süditalien. Von besonderem Interesse ist das Eins-zu-viele-Problem in der historischen Ableitung, bei dem ein gegebenes phonetisches Ergebnis über mehrere Wege erreicht werden kann, wie die beiden phonetischen Entwicklungen /kl/ > [kʎ] > [kj] > [c] > [tʃ] > [ʃ] und /kl/ > [kʎ] > [çʎ] > [çj] > [ʃ] veranschaulichen.

Résumé

La présente étude porte sur le développement historique des groupes de syllabes /kl gl pl bl fl/ dans les langues et dialectes romans et sur leur motivation articulatoire et/ou perceptive. Plusieurs voies diachroniques sont identifiées, qui partent de séquences articulatoires instables [Cʎ], plus particulièrement la vocalisation de la consonne latérale (par exemple, [kʎ] > [kj]) et la lénition de la consonne obstruante (par exemple, [kʎ] > [çʎ]). La plupart des changements phonétiques sont attribués à la variation articulatoire dans la mesure où ils ont besoin d'ajustements du degré et de la localisation de la constriction. Dans quelques cas, le remplacement d'un son consonantique par un autre semble avoir été induit par une équivalence acoustique-perceptive, comme par exemple la substitution de [θ] par [f] en franco-provençal et des occlusives labiales palatalisées par des occlusives palatales en Italie du Sud. Le problème des dérivations multivoques est particulièrement intéressant, car il permet d'obtenir un résultat phonétique donné par plusieurs voies, comme l'illustrent les deux développements phonétiques /kl/ > [kʎ] > [kj] > [c] > [tʃ] > [ʃ] et /kl/ > [kʎ] > [çʎ] > [çj] > [ʃ].

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