Preprint version of:

JIMÉNEZ, Jesús; LLORET, Maria-Rosa; PONS-MOLL, Clàudia, «Adjusting to the syllable margins: Glides in Spanish and Catalan», dins Mark Gibson & Juana Gil (eds.), *Romance Phonetics and Phonology*, Oxford, Oxford University Press, 2019, p. 276-298. ISBN 9780198739401.

15

Adjusting to the syllable margins

Glides in Catalan and Spanish

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15.1 Introduction

The asymmetric behavior of the two syllable margins (i.e., onset and coda) is usually accounted for by means of intrasyllabic sonority conditions: less sonorant segments are preferred in simplex onsets, because they are more distant in terms of sonority from the following nucleus (typically, a vowel) and hence better enhance the properties of the nucleus; more sonorant segments are instead preferred in simplex codas, because they are closer in sonority to the previous nucleus and hence reduce the syllabic complexity by minimizing the contrast with it (with no elements in the coda at all being the preferred structure; see Vennemann 1988; Clements 1990; Baertsch 2002; Prince and Smolensky 2004; Smith 2005). Owing to these tendencies, many modifications affecting onsets are strengthening phenomena, whereas modifications affecting codas are usually of the weakening type. These generalizations, though, have to coexist with other preferences that languages show, which in some cases may conflict with one another. For example, in contrast to the tendency to strengthen onsets, other contextual markedness conditions favor alternative options, as is the case for intervocalic position, where less constricted onsets are preferred in order to achieve a more homogeneous

sonority profile with the surrounding vowels (see, e.g., Kirchner 1998, 2004; Uffmann 2007).

The modifications that glides undergo in onsets and their preservation in codas in Catalan and Spanish illustrate the intermingling of the tendencies just mentioned. The variation that glides present thus offers an ideal scenario in which to evaluate which factors trigger the changes and how they interact to yield apparently contradictory results. It also offers good grounds for testing the adequacy of Optimality Theory (OT; Prince and Smolensky 2004) to deal with the typology of strategies attested in languages to adjust their shape to phonological requirements. Here, we do not offer a description of all the phenomena affecting glides in Catalan and Spanish, but just make use of specific cases that exemplify the range of repair strategies in which the two glides, /j/ and /w/, are involved.[1] The chapter is organized as follows. We begin with the description of the behavior of glides in some varieties of Spanish (Section 15.2) and Catalan (Section 15.3); we then present and discuss an OT analysis of these facts (Section 15.4), and we end with some final conclusions (Section 15.5).

[1] Since the aim of this work is not to discuss the phonemic status of the nonsyllabic realization of the two high vocoids, we assume for convenience that [j] and [w] derive from /j/ and /w/ when they do not alternate with their vocalic counterparts, including, for the former, cases historically derived from the delateralization of /ʎ/, present in both languages. We do not further examine the delateralization phenomenon here, nor do we deal with examples that involve /i/ or /u/ gliding.

15.2 The behavior of glides in Spanish

The two glides of Spanish (i.e., /j/ and /w/) follow the general tendency of strengthening in onsets, while remaining weak in codas (see, e.g., Aguilar 1997). However, the degree of constriction that they tolerate is not always the same, because specific contexts may activate alternative adjustments. The data we are going to discuss come mainly from Castilian Spanish, drawn from the *Atlas lingüístico etnográfico de Castilla-La Mancha* (*ALeCMan*; García Mouton and Moreno 2003), which is a representative sample of Eastern Castilian Spanish.

15.2.1 The labiovelar glide

In the second position of a complex onset (as in *dueño* 'owner') and in coda position (as in *jaula* 'cage'), the labiovelar glide (/w/) is maintained unchanged ([ˈdwe.ɲo], [ˈxaw.la] in *ALeCMan*: maps FON-89 and FON-101, respectively). In contrast, in simplex onsets, /w/ shows different degrees of strengthening depending on the context in which it occurs. In absolute word-initial position, the realizations include preservation of the glide (as in *huelo* [ˈwe.lo] 'I smell') as well as reinforcements through the presence of an additional preceding velar obstruent ([ˈgwe.lo]) or, less commonly, of an additional labial obstruent ([ˈbwe.lo]). For example, in *ALeCMan*, for the word *huelo* (map GRA-127; see Figure 15.1) there are four instances of [w] preservation, eight with labial reinforcement, and 122 with velar reinforcement. The

realization of the additional velar consonant in *huelo* is regularly a stop ([ˈgwe.lo], 121 cases) and very occasionally a spirant consonant ([ˈɣwe.lo], one case).[2]

In the patrimonial lexicon, all words affected by this word-initial reinforcement begin with <hue> (*huelo*, *hueco* 'hollow', *huella* 'trace', *huerto* 'orchard', *hueso* 'bone', *huésped* 'guest', *huevo* 'egg' …) and the variability of the reported pronunciations is considered to be a case of free variation (RAE–ASALE 2011: 352). Strengthening through the realization of an additional preceding velar obstruent is an old solution. It is responsible for orthographic duplets such as *huero* ~ *güero* 'empty', or for duplets in the adaptation of loans from Nahuatl (e.g., *huipil* ~ *güipil* 'a kind of blouse') and Quechua (e.g., *huiro* ~ *güiro* 'stalk of green corn', *guaca* ~ *huaca* 'old grave') (RAE–ASALE 2011: 301), and also for the adaptation of the loan from English *güisqui* 'whisky'. More recent loans show the same degree of variability as patrimonial words: e.g., *waterpolo*,

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[2] In Spanish, as well as in Catalan, [β], [ð], and [ɣ] phonetically show a lesser degree of stricture than is usually regarded as characteristic of fricatives. This is especially noticeable in the lack of acoustic turbulence (see, e.g., Martínez Celdrán 1984, 2004, and RAE–ASALE 2011: 133–5 for Spanish; Recasens 1991, 1993 for Catalan). Because of this, they are sometimes referred to as *approximants* (and are accurately represented as [β̞], [ð̞], and [ɣ̞]),or more precisely as *spirant approximants* to differentiate them from other approximants such as glides, laterals, and rhotics (see e.g., Martínez Celdrán 2004; Figueroa Candia 2011). Phonologically, however, these sounds behave as obstruents, because they morphophonemically alternate with their stop counterparts; hence, for our purposes we refer to them as *spirant fricatives* (see more arguments, e.g., in Wheeler 2005: 23).

web (RAE–ASALE 2011: 301), *wasapear* ~ *guasapear* ‘to whatsapp’, *western* (film) or *wifi*.[3]

In intervocalic position, there are reinforcements with realization of an additional velar spirant fricative (as in *cacahuete* [ka.kaˈɣwe.te] ‘peanut’, *ahuecar* [aˈɣwe.kaɾ] ‘to hollow out’) and, less frequently, just maintenance of the glide ([ka.kaˈwe.te], [a.weˈkaɾ]). These variants are also documented for loans, as in *kiwi*. Despite the variety of reported pronunciations (see, e.g., RAE–ASALE 2011: 299–301), in *ALeCMan* almost all realizations of the word *cacahuete* (map QII-230; see Figure 15.1) are transcribed with a preceding spirant fricative (177 cases out of 178; the other case has a velar stop [g]). This homogeneity agrees with Hualde’s (2005: 171) suggestion that intervocalically there is no contrast between [w] and [ɣw] in standard Castilian, regardless of their orthographic representation as <hu> (as in *cacahuete* or *vihuela* ‘vihuela’) or <gu> (as in *cigüeña* ‘stork’). The realization of an additional obstruent gives rise to onsets that maximize the contrast with the nucleus, whereas the preservation of the glide—not attested in *ALeCMan*—minimizes the sonority distance (and thus the articulatory effort) from the surrounding vowels. The possibility of deleting the original labiovelar glide (i.e. *[ka.kaˈe.te]) to reduce the consonantal transition to the minimum does not exist in Spanish.

[3] Gothic names, as well as loans taken from German and a few other cases with orthographic <w>, were phonetically adapted with /b/ (<v> or <w> in Spanish), as in *Wamba*, *Wagner*, *wolframio* or *volframio* ‘wolfram’, *vals* ‘waltz’, and *vagón* (from the English word *wagon*) (RAE–ASALE 2011: 301).

Figure 15.1 illustrates the incidence of the outcomes found in *ALeCMan* for /w/ in *huelo* and *cacahuete*. (We only consider variants containing the glide [w], and so ignore geosynonyms such as *cacao* [kaˈka.o] or *cacagué* [ka.kaˈɣe] for *cacahuete*).

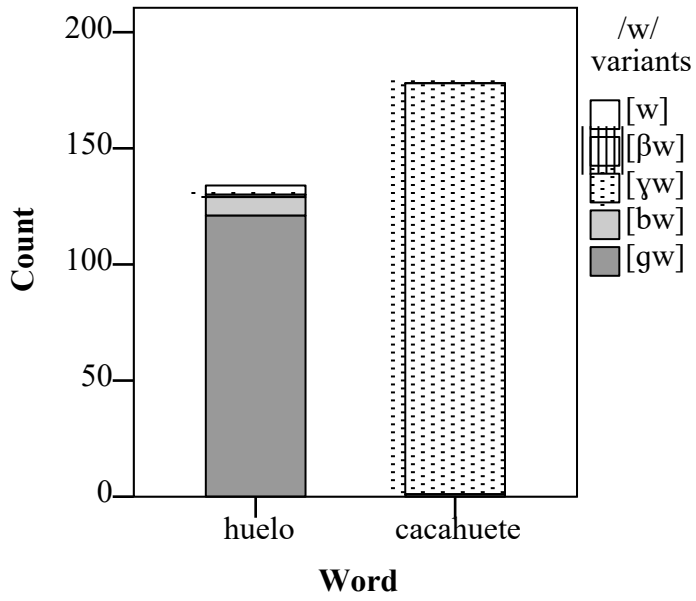

Figure 15.1 Realization of /w/ in *huelo* and *cacahuete* in Castilian Spanish. Variants for *huelo*: [w], 4 cases; [ɣw], 1 case; [bw], 8 cases; [gw], 121 cases. Variants for *cacahuete*: [ɣw], 177 cases; [gw], 1 case

Data from maps GRA-127 and QII-230 from *ALeCMan*

15.2.2 The palatal glide

Like the labiovelar glide, the palatal glide (/j/) also tends to adjust to the context in which it appears, but the adaptation is usually accomplished through changes in the degree of constriction of the glide rather than by the realization of an additional preceding consonant. Another important difference with respect to /w/ is that the outcomes of /j/ display a significantly greater degree of geographical variation.

In absolute word-initial onset position (as in *yerno* ‘son-in-law’ or *yugo* ‘yoke’),[4] the emergence of the glide [j] is very rare (e.g., [ˈjeɾ.no], [ˈju.ɣo]). The most common alternatives include strengthening through a first degree of constriction with the result of a fricative, either nonsibilant ([ˈʝeɾ.no], [ˈʝu.ɣo]) or sibilant ([ˈʒeɾ.no], [ˈʒu.ɣo]), or a further degree of constriction with the result of an affricate, either nonsibilant ([ˈd͡ʝeɾ.no], [ˈd͡ʝu.ɣo]) or sibilant ([ˈd͡ʒeɾ.no], [ˈd͡ʒu.ɣo]). The nonsibilant (fricative and affricate) reinforcements are very frequently documented in *ALeCMan*, though the sibilant variants are also sporadically reported, especially in the Western part of this region (i.e., Toledo and Ciudad Real) The sibilant variants are more common in parts of Andalusia and Extremadura, and also in different regions of America, such as Argentina or parts of Mexico (see, e.g., Hualde 2005: 166).[5]

As with /w/, strengthening through consonantization of /j/ gives rise to orthographic duplets such as *hierba* ~ *yerba* ‘grass’ or *hiedra* ~ *yedra* ‘ivy’. Sporadically in the literature we have reviewed, and especially in the province of Cuenca, words that begin with /je/- have developed a further variant with the glide reinforced by a velar stop (as in *yerno* [ˈgjeɾ.no], hierba [ˈgjeɾ.βa]), or even

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[4] In *ALeCMan* the word *yerno* is elicited after a lateral (*el yerno*, map FON-202), which is a context usually regarded as equivalent to the absolute word-initial position in the literature (see, e.g., Hualde 2005: 167).

[5] The virtual nonexistence of [j] realizations in simplex onsets (both word-initially and word-internally) has led some authors to assume that the phonological system of Spanish displays /ʝ/ (or /ʒ/, /d͡ʒ/ in certain varieties) instead of /j/ (see, e.g., RAE–ASALE 2011: 220–7, 299–300). For our present purposes we can disregard this issue.

sporadically by a palatal fricative (as in [ˈʝjeɾ.no], [ˈʝjeɾ.βa]).[6] The reinforcement as [gje] is most probably due to the analogical influence of the parallel /we/- words, which, as noted in Section 15.2.1, tend to strengthen the onset with an additional velar obstruent (cf. *huelo* [ˈgwe.lo]) (Jiménez 1996; Hualde 1997; Brazeal 2005).

In intervocalic onset position, the same reinforced variants as in word-initial position are attested, except for the absence of additional velar or palatal obstruents (e.g., *mayo* *[ˈma.ɣjo], *[ˈma.ʝjo] 'May'). As above, the nonsibilant ([ˈma.ʝo]) and sibilant ([ˈma.ʒo]) fricative variants as well as the nonsibilant affricate variant ([ˈma.d͡ʝo]) are documented in *ALeCMan*. Unlike the case in word-initial position, intervocalically the maintenance of the glide variant—without any reinforcement—is relatively more frequent ([ˈma.jo]), especially in the Eastern part of this region (i.e., Cuenca and Albacete).[7]

Figure 15.2 illustrates the incidence of the outcomes found in *ALeCMan* for /j/ in *yugo* (map CAM-266), *(el) yerno* (map FON-202), and *mayo* (map FON-9). The notations [ʝ/j] and [ʝ/ʒ] indicate, respectively, an open central palatal, close to a glide,

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[6] The exceptional emergence of a velar obstruent in [gje]- is documented in *ALeCMan* in the province of Cuenca mainly, as in *(el) yerno* (map FON-202) and *hierba* 'grass' (FON-92). It is also documented in the *Atlas Lingüístico de la Península Ibérica* (*ALPI*) for the Spanish spoken in the neighboring region of Valencia (see Garcia Perales 2001: iii, QI-CAST-134 for *yerno* and QI-CAST-166 for *hierba*).

[7] The glide may be completely deleted in certain Spanish varieties, especially when adjacent to a front vowel (e.g., *cayendo* [kaˈen̪.do] 'falling down', *creyó* [kɾeˈo] 'he believed' in Chilean Spanish; RAE–ASALE 2011: 225).

and a fronted central fricative palatal. (Geosynonyms for *yugo* without any sound related to the initial glide /j/, such as *troza* ['tro.θa] or *ubio* ['u.βjo], are not counted.)

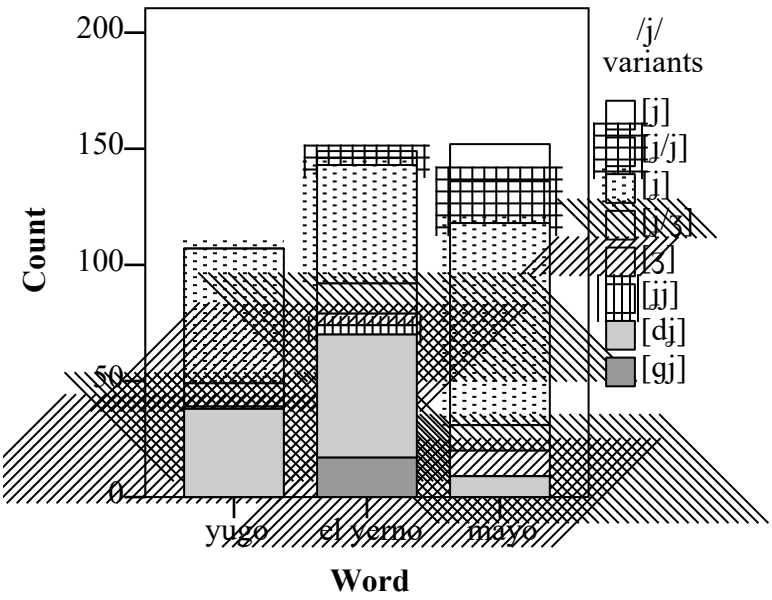


Figure 15.2 Realization of /j/ in *yugo*, *(el) yerno*, and *mayo* in Castilian Spanish

Variants for *yugo*: [j], 58 cases; [j/ʒ], 10 cases; [ʒ], 1 case; [d͡j], 38 cases. Variants for *(el) yerno*: [j], 3 cases; [j/j], 3 cases; [j], 51 cases; [j/ʒ], 13 cases; [ʒ], 5 cases; [jj], 4 cases; [d͡j], 53 cases; [gj], 17 cases. Variants for *mayo*: [j], 16 cases; [j/j], 18 cases; [j], 87 cases; [j/ʒ], 11 cases; [ʒ], 11 cases; [d͡j], 9 cases

Data from maps CAM-266, FON-201, and FON-9 from *ALeCMan*

Finally, in the syllabic positions where more sonorous segments are optimal margins (i.e., in codas and in the second position of complex onsets), the glide realization is the usual pronunciation in all varieties: for instance, in *rey* ['rej] 'king' or *pie* ['pje] 'foot' (see *ALeCMan*: maps FON-98 and FON-94, respectively).

15.3 The behavior of glides in Catalan

The two glides of Catalan (i.e., /j/ and /w/) also show instances of strengthening in onsets, but to a much lesser extent than in Spanish. Another important difference is that, in some Catalan varieties, intervocalic onset glides display radical weakening processes, a phenomenon that is almost unknown in Castilian Spanish. Here, we mainly contrast data from Central Eastern Catalan with data from the Valencian variety and especially with data from the Balearic variety, because of its singularity.

15.3.1 The labiovelar glide

In Catalan, the general tendency of /w/ is to be maintained as a glide in all syllable margins. An important phonotactic characteristic of Catalan is that it has a limited set of words beginning with a /w/, which are generally loans: e.g., *walkman*, *web*, *western* (film), *whisky* (Lloret 2002: 211), *whatsapp*, *Wi-Fi*). Though these words sporadically show occurrences of reinforcements via velar obstruent addition (e.g., [gw]*eb*, [gw]*isky*), the most common pronunciation is with maintenance of the glide (e.g., [w]*eb*, [w]*isky*).[8]

[8] As in Spanish, there are also adaptations with /b/ (or /v/ in dialects that distinguish the labial stop from the labial fricative), as in *Wagner*, *vagón*, and *vals* (see fn. 3). In Majorcan Balearic, the adaptation of initial /w/ as [v] in more recent loans is characteristic of elderly people (e.g., [v]*atsapp* 'WhatsApp'), which thus follow the regular pattern of /w/ in intervocalic position (see below).

Valencian shows the peculiarity of displaying a few patrimonial words with a word-initial labiovelar glide, which are regularly pronounced without strengthening: *hui* [ˈwi] ‘today’ (*avui* in other dialects, cf. [əˈβuj] in Central Eastern Catalan); *huit* [ˈwit] ‘eight’ (*vuit* in other dialects; cf. [ˈbujt] in Central Eastern Catalan). The tendency not to reinforce the initial labiovelar glide in Valencian is so strong that in many varieties it attracts the sequence /gw/, which is simplified as [w], as in *guapo* [ˈwa.po] ‘handsome’ (Garcia Perales 2001: iii, QI-VAL-8); the reduction of /gw/ is even more frequent in intervocalic onsets, as in *egua* [ˈe.wa] ‘mare’ (Garcia Perales 2001: iii, QI-VAL-39; *Atles lingüístic del domini català* [*ALDC*], Veny and Pons i Griera 2001–12: vi, map 1371) or *aigua* [ajˈwa] ~ [awˈja] ‘water’ (*ALDC*: ii, map 259).[9] Nonetheless, there are also some Valencian varieties that reinforce word-initial labiovelar glides with [g], both in loans ([gw]*isky*) and in the patrimonial words mentioned (*hui* [ˈgwi]; Garcia Perales 2001: iii, QI-VAL-379).

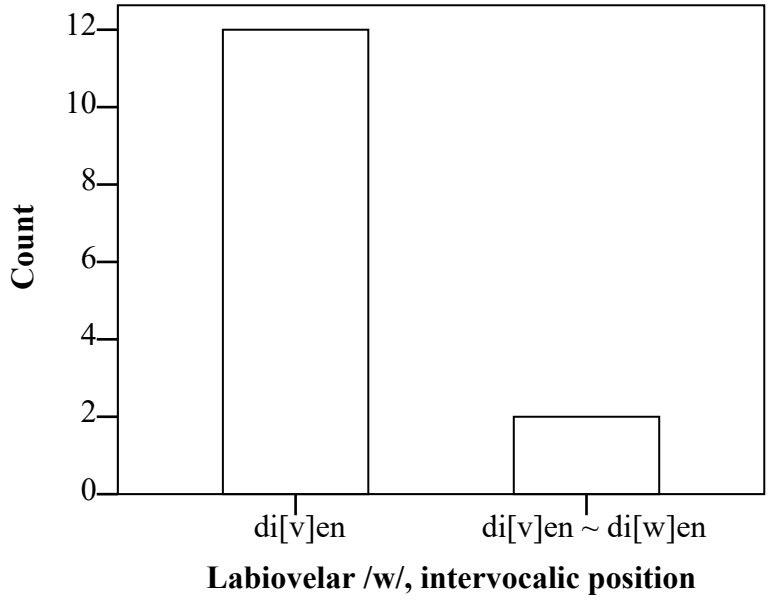
In intervocalic onset position, in addition to the maintenance of the glide (e.g., *diuen* [ˈdi.wən] ‘they say’, *cacauets* [kə.kəˈwɛt͡s] ‘peanuts’ in Central Eastern Catalan) and optional simplification in [wu] sequences (e.g., *creuo* [ˈkɾɛ.wu] ~ [ˈkɾɛ.u] ‘I cross’ in Central Eastern Catalan), alternative local pronunciations are reported in the literature, which adapt to the surrounding environment in two opposite ways. On the one hand, the tendency to avoid glides in onsets generally leads Majorcan Balearic varieties to strengthen /w/ by turning it into the labiodental fricative [v], as in *diuen* [ˈdi.vən], *bouet* [boˈvət] ‘little ox’ (cf. *diu* [ˈdiw] ‘he says’, *bou* [ˈbɔw] ‘ox’), and

[9] The weakening of /gw/ as [w], already noted by Barnils (1913: §170) with respect to Southern Valencian, is also reported by Colomina Castanyer 1985; Sancho Cremades 1995; Segura i Llopes 2003; and Giner Monfort 2013.

cacauets [kə.kəˈvet͡s] or [ko.koˈvet͡s] ‘peanuts’, also documented as [ka.kaˈwet͡s] in the *Diccionari català-valencià-balear* (*DCVB*; Alcover and Moll 1930–62).[10] Figure 15.3 illustrates the incidence of the outcomes found in Perea (1999) for the word *diuen* in Majorcan Catalan.

Figure 15.3 Realization of /w/ in *diuen* in Majorcan Catalan Cases with [v], 12; cases with [v] ~ [w], 2

Perea (1999: 356)



On the other hand, in other Majorcan varieties and less frequently in some areas of Southern Valencian, a root-final labiovelar glide sited after a labial vowel can disappear

[10] Fricativization of intervocalic /w/ is also documented in the adaptation of some recent loans such as *kiwi* [ˈki.vi] ([ˈki.wi] ~ [ˈki.βi] in the Central Eastern varieties, where /v/ merged to /b/) (see also fn. 8). An alternative reinforced variant of /w/, with an added velar spirant fricative, is sporadically found in Valencian, as in *meua* [ˈme.ɣwa] ‘mine (feminine)’ (Colomina Castanyer 1985; Saborit 2009).

before a vowel-initial affix, thus minimizing the articulatory effort in the transition between the remaining vowels at the expense of eventually displaying a hiatus, as in *bouet* [boˈət] (Majorcan), [boˈet] (Southern Valencian) (see Bibiloni 1983, and Dols 2000, for Balearic; Colomina Castanya 1991; Beltran Calvo 2011; Beltran Calvo and Herrero Lloret 2011a, b, and Giner Monfort 2013, for Valencian). In words such as *bouet*, the reinforcement of /w/ as [v] and its reduction to zero are mutually exclusive strategies in the Majorcan varieties (Dols 2000: 235).

Finally, in coda position maintenance of the glide is almost the only possible outcome in Catalan, as it is in Spanish: e.g., *di*[w], *bo*[w]. The same happens with the second position of complex onsets (e.g., *q*[w]*estió* 'question'); although if [wu] sequences are involved, simplification to [u] is also possible (e.g., *adequo* [əˈðɛ.kwu] ~ [əˈðɛ.ku] 'I accommodate'; see, e.g., Wheeler 2005: 122). Other less systematic simplifications occur in sequences where the labiovelar glide is preceded by a velar obstruent and followed by *a*. For instance, in unstressed position the glide can fuse with the following vowel, as in *Quaresma* 'Lent', attested as [kuˈɾɛz.mə] in Central Eastern Catalan, [koˈɾez.ma] in Valencian and other Western varieties, and [koˈɾə.mə] or [kuˈɾə.mə] in Balearic, where the phenomenon is more general (*ALDC*: iii, map 569). In unstressed word-final position, though, the glide most typically deletes in some Eastern non-Balearic varieties, as in *aigua* [ˈaj.ɣə], *Pasqua* [ˈpas.kə] 'Easter' (cf. [ˈaj.ɣo] or [ˈaj.ɣu], [ˈpas.ko] or [ˈpas.ku] in Balearic; *ALDC*: ii, 259 and iii, maps 573, respectively). In stressed syllables, the glide and the vowel are maintained (e.g., *guants* [ˈgwans] 'gloves', *quan* [ˈkwan] 'when'), although sporadic instances of fusion are also reported for Balearic (e.g., *qualque* [ˈkwal.kə] or [ˈkɔl.kə] 'some' in Majorca; see Bibiloni 1983; Veny 1983, 1999; Dols 2000).

15.3.2 The palatal glide

Unlike Spanish, in Catalan /j/ tends to be realized as a glide in all contexts. As expected, there are no changes of constriction in the prosodic positions where the glides are optimal margins, i.e., in the second position of complex onsets (e.g., *miss*[j]*ó* 'mission') or in codas (e.g., *re*[j] 'king') , except for the simplification of [ij] sequences (e.g., in Majorcan Catalan *fill* [ˈfij] ~ [ˈfi] 'son', derived from /fij/ owing to /ʎ/-delateralization, vs. *fiï* [ˈfi.i], *[ˈfij], *[ˈfi] 'he trust (subjunctive)', derived from /fi + i/).

As with the labiovelar glide, there are few words beginning with /j/, most of which descend from loans (e.g., *iogurt* 'yogurt', *iot* 'yacht', *ien* 'yen') and learned words (e.g., *hiat* 'hiatus', *iode* 'iodine'). There are also the patrimonial words *jo* [ˈjɔ] 'I' and *ja* [ˈja] 'already' (/ʒɔ/, [ˈʒɔ] and /ʒa/, [ˈʒa], in other varieties).[11] In general, word-initial /j/ onsets are realized as glides (e.g., [j]*ogurt*, *jo* [ˈjɔ], *ja* [ˈja]). Instances of reinforcement via fricativization resulting in a sibilant are reported for Majorcan Catalan (e.g., [ʒ]*ogurt*) and via sibilant affrication for varieties of Valencian (as in the delateralized pronunciations of the words *llet* [ˈd͡ʒet] 'milk' and *llengua* [ˈd͡ʒeŋ.gwa] 'tongue'; see Segura i Llopes 1996, 1998, 2003; Zaragozà 2000; Saborit 2009; Moratal Canales 2011).

[11] There also exist the fossilized verbal forms *hi ha* [ˈja] 'there is', *hi havia* [jəˈβi.ə] 'there was', etc., where the glide derives from the locative clitic *hi* /i/ 'there' (cf. *hi compra* [iˈkom.pɾə] 'he buys there', but *hi agafa* [jəˈɣa.fə] 'he takes there'), with the proclitic reinforced form [əj] in Majorcan (cf. *hi ha* [əˈja] or [əˈe̯a], as in *hi compra* [əjˈkom.pɾə]).

In intervocalic-onset position, Catalan preserves the palatal glide (e.g., *feia* [ˈfɛ.jə] ‘I did’, *deia* [ˈdɛ.jə] ‘I said’), but [ji] sequences simplify to [i] (e.g., *desmaï* [dəzˈma.i] ‘he faint (subjunctive)’, from /dəzmaj + i/; Wheeler 2005: 122). In this position, Majorcan Catalan tends to weaken the articulation of the palatal glide, which either is realized as a slightly more centralized and open glide (represented here as [e̯]) or is completely deleted at the expense of creating a hiatus (especially in contact with a nonlabial vowel), as in *feia* [ˈfə.e̯ə] ~ [ˈfə.ə], *deia* [ˈdə.e̯ə] ~ [ˈdə.ə] (see Mascaró and Rafel 1981; Bibiloni 1983; Veny 1983; Dols 2000; Recasens and Espinosa 2005). Intervocalic palatal-glide deletion is occasionally attested in Valencian as well; the phenomenon is quite widespread in the case of certain verbal forms (e.g., *feia* [ˈfe.a]; see Garcia Perales 2001: iii, QI-VAL-372) and extends to other words in parts of Southern Valencian, as in *palaia* [paˈla] ‘plaice’ (Colomina Castanyer 1991; Beltran Calvo 2011; Beltran Calvo and Herrero Lloret 2011a; Giner Monfort 2013). Figure 15.4 shows the outcomes found in Perea (1999) for the realizations of intervocalic /j/ in the word *deia* in Majorcan Catalan.

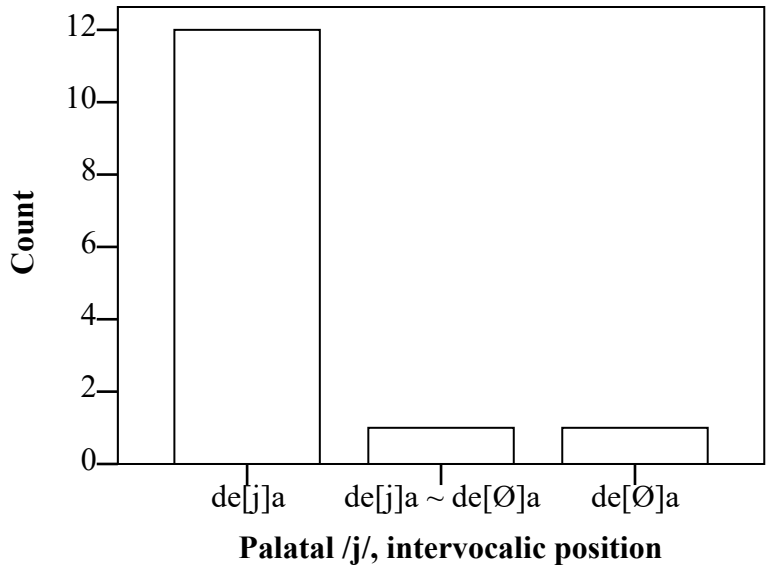


Figure 15.4 Realization of /j/ in *deia* in Majorcan.Cases with [j], 12; cases with [j] ~ [ø], 1; cases with [ø], 1

Perea (1999: 732)

15.4 An OT analysis

15.4.1 Sonority-adjusting triggers and faithfulness: The basic constraint set

Our account of the adjustments that glides undergo in Spanish and Catalan basically builds on the interaction between two families of markedness constraints targeting the glides within the syllable and across syllables. The constraints focusing on each syllable by itself without considering the surrounding context are taken from the split-margin hierarchy developed by Baertsch (2002), which augments Prince and Smolensky's (2004: 160) margin hierarchy so as to distinguish the structural positions that promote low-sonority segments from those that promote high-sonority ones. Segments with low

sonority are favored in simplex onsets and in the first position of a complex onset (merged into *Margin 1*, M1), as established in the ranking in (1) (see also Smith 2005).[12] In contrast to the M1 position, both in codas and in the second position of complex onsets (merged into *Margin 2*, M2) segments of high sonority are preferred (2).[13]

(1) Constraint hierarchy for M1 (*M1/λ) (where less sonorous segments are preferred):
*M1/GLIDE$_{[-HI]}$ ≫ *M1/GLIDE$_{[+HI]}$ ≫ *M1/LIQUID ≫ *M1/NASAL ≫ *M1/FRICATIVE ≫ *M1/STOP

(2) Constraint hierarchy for M2 (*M2/λ) (where more sonorous segments are preferred):
*M2/STOP ≫ *M2/FRICATIVE ≫ *M2/NASAL ≫ *M2/LIQUID ≫ *M2/GLIDE$_{[+HI]}$ ≫ *M2/GLIDE$_{[-HI]}$

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[12] Prince and Smolensky's (2004) margin hierarchy gives preference to segments of low sonority as well, but applies only to singleton onsets.

[13] The assumed sonority scale for consonants in (1) through (3) is the following: Glides$_{[-HI]}$ > Glides$_{[+HI]}$ > Liquids > Nasals > Fricatives > Stops, where spirant and nonspirant fricatives are subsumed under Fricatives, and stops and affricates under Stops. Moreover, we replace the ranking between [+high] and [+low] vocalic margins proposed in Baertsch (2002) with a distinction between [+high] and [–high] glide margins, a division which, as we will show next, is crucial to understanding the behavior of intervocalic palatal glides in Majorcan Catalan.

On the other hand, if the environment surrounding each syllable is considered, segments of high sonority are also preferred in the leftmost position of intervocalic onsets, as established by the constraint hierarchy in (3). This context-dependent ranking favors consonants with less constriction in intervocalic M1 positions, thus promoting a smoother vowel-to-vowel transition as far as sonority is concerned. That is, in opposition to the *M1/λ hierarchy in (1), which favors maximum contrast between the peak and the leftmost element in the onset, the $V\lambda_{M1}V$ constraints promote gestural uniformity beyond syllable boundaries (see, e.g., Kirchner 1998, 2004; Uffmann 2007). This type of constraint was originally conceived for transitions with a consonant surrounded by vowels; however, given the similarities between vowels and glides, we extend the hierarchy to vowel-consonant-glide-vowel sequences through reference to the M1 position.

(3) Constraint hierarchy for M1 in intervocalic position ($*V\lambda_{M1}V$) (where more sonorous segments are preferred):
$*V\text{STOP}_{M1}V \gg *V\text{FRICATIVE}_{M1}V \gg *V\text{NASAL}_{M1}V \gg *V\text{LIQUID}_{M1}V \gg$
$*V\text{GLIDE}_{[+\text{HI}],\,M1}V \gg *V\text{GLIDE}_{[-\text{HI}],M1}V$

So far, we have only introduced markedness constraints defining—sometimes in opposite directions—the configurations that fit best in each syllabic position. However, the adaptation of glides to the environment driven by these markedness constraints may lead to the violation of some faithfulness constraints. This is the case, for instance, of the faithfulness constraint INTEGRITY (4), which bans the presence of multiple-output correspondents for a single-input segment, like the ones found in the /w/-reinforcement through the realization of an additional consonant in Castilian Spanish: *huelo* [ˈgwe.lo]

(see Section 15.2.1). Namely, an output such as [ˈgwe.lo] is penalized by INTEGRITY because, along with the splitting theory of consonant epenthesis that we adopt (Staroverov 2014; see also Yip 1996; Baković 1999; Krämer 2008), it is analyzed as the result of a process whereby /w/ *splits* into a velar stop followed by a labiovelar glide: /w$_1$elo/, [ˈg$_1$w$_1$e.lo].[14]

(4) INTEGRITY: Assign one violation mark for every input segment that has more than one output segment correspondent. (See McCarthy and Prince 1995.)

The interpretation of the sequence [gw] as the result of a splitting process, rather than as the outcome of an insertion process, straightforwardly predicts the quality of the additional consonant: since the surface split velar consonant is in correspondence with /w/, featural faithfulness constraints require it to be as similar as possible to the input segment.[15] Therefore, the two segments derived from the process of splitting (e.g., /w$_1$elo/ [ˈg$_1$w$_1$e.lo])—as well as the ones found in sheer strengthened outcomes (e.g., /j$_1$ugo/ [ˈd͡ʝ$_1$u.ɣo])—are crucially evaluated by another set of faithfulness constraints: those that belong to the IDENT family and that control featural changes. On the one

[14] Whenever relevant, we use indices to designate input and output segments that stand in a correspondence relation.

[15] Alternatively, we could treat the velar consonant as an epenthetic segment: /w$_1$elo/ [ˈg$_2$w$_1$e.lo]. In this approach, we would need other faithfulness constraints penalizing feature insertion (e.g. DEP$_{[VEL]}$; see Jiménez and Lloret 2013). For simplicity, we do not consider candidates with epenthesis; we are aware, though, that this is a case of structural ambiguity.

hand, the manner features of the output are regulated by the constraint ID-GLIDE—in both its standard (5a) and its existential versions (5b).

(5) a ID-GLIDE: Assign one violation mark for every input glide when some of its output correspondents is not a glide. (Adapted from McCarthy and Prince 1995)

b ID-GLIDE$_{EXISTENTIAL}$: Assign one violation mark for every input glide when none of its output correspondents is a glide. (Adapted from de Lacy and Struijke 2000, and Struijke 2002)

These two kinds of IDENT faithfulness constraints differ in their degree of strictness regarding the featural identity between the input segment and its output correspondents: standard IDENT faithfulness constraints demand that *every* output segment preserves the underlying featural specification, whereas EXISTENTIAL-IDENT faithfulness constraints demand that *at least some* output correspondent preserves the featural specification of the input segment**.** If the reinforcement is accomplished only through changes in constriction (as in /j$_1$ugo/ [ˈd͡ʝ$_1$u.ɣo]), both versions of ID-GLIDE are violated, because there is no glide corresponding to the original /j/. By contrast, split outcomes (as in /w$_1$elo/ [ˈg$_1$w$_1$e.lo]) violate ID-GLIDE because one correspondent of /w/ is not a glide, but satisfy ID-GLIDE$_{EX}$ because the glide character is at least preserved in one of the two output correspondents.

On the other hand, the segments that are in correspondence with the glide seek to replicate its input place features as well. As a result, the outcomes of the labiovelar glide are expected to have Labial and Velar specifications (due to ID-[LAB] and ID-[VEL], respectively), whereas the correspondents of the palatal glide are expected to have the

Palatal specification (due to ID-[PAL]).[16] However, total replication of the place features of the input glide in split segments is ruled out by the version of the Obligatory Contour Principle (OCP) disallowing continuous adjacent consonants with the same place specifications; hence, it rules outmappings such as [ˈd͡ʝ$_{1}$j$_{1}$u.ɣo] from /j$_{1}$ugo/.[17]

Given the complexity and variability of the data reported in Sections 15.2–15.3, in the following sections we concentrate on the most common outcomes for Castilian Spanish (Section 15.4.2), Central Eastern Catalan (Section 15.4.3), and Majorcan Catalan (Section 15.4.4).

15.4.2 A one-way adjusting variety: Castilian Spanish

As shown in Section 15.2, in most Castilian Spanish varieties the glides /w/ and /j/ remain unaltered both in coda position (*ja*[w]*la*, *re*[j]) and as a second element of a complex onset (*d*[w]*eño*, *p*[j]*e*). These are the optimal outcomes (as they are in Catalan as well; see Sections 15.4.3–15.4.4), captured in the analysis through the low ranking of the constraints referring to the glides in the *M2/λ hierarchy presented in (2).

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[16] Although the existential versions of these constraints were also considered to test the ranking arguments through OT-Soft, in the chapter we just include the ones that are essential for the analysis.

[17] The OCP constraint is also responsible for the absence of /wu/ and /ji/ sequences in the patrimonial lexicon of Spanish as well as for the simplification of these sequences in Central Eastern Catalan (cf. *creuo* [ˈkɾɛ.wu] ~ [ˈkɾɛ.u], from /kɾɛw + u/, Section 15.3.1; *desmaï* [dəzˈma.i], from /dəzmaj + i/, Section 15.3.2).

When placed in onset position, /w/ undergoes a process of strengthening that typically involves the realization of an additional consonant, either in word-initial position (*huelo* [ˈgwe.lo]) or in word-internal position (*cacahuete* [ka.kaˈɣwe.te]).[18] Both reinforcements reveal that in Castilian Spanish a glide is not allowed as the first element of an onset, as a result of the pressure exerted by *M1/GLIDE at the top of the ranking. The ranking of the relevant constraints we are using to account for the facts of Castilian Spanish is presented in (6).[19]

(6) Constraint ranking for Castilian Spanish:

*M1/GLIDE, *VSTOP$_{M1}$V, ID-[VEL], ID-[PAL], OCP ≫ *M1/FRIC, *VFRIC$_{M1}$V, ID-[LAB], ID-GLIDE, ID-GLIDE$_{EX}$ ≫ INTEGRITY

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[18] In some varieties in our corpus, the voiced velar stop ([g]) can also appear in related forms such as *olemos* [oˈle.mos] ~ [goˈle.mos] 'we smell' (*ALeCMan*: map GRA-128), in which the glide is absent and thus the velar segment is not explained by markedness. Most probably, in these cases the velar consonant reinforcing the glide has been incorporated into the underlying representation via lexical diffusion. However, considering Richness of the Base and the behavior of loans (in which the process is still productive), the ranking must still account for the general absence of [w] in M1 position.

[19] Neither Castilian Spanish nor Central Eastern Catalan show any empirical evidence for distinguishing between [+high] and [–high] glides. Therefore, we use generic constraints such as *M1/GLIDE to refer to both categories in their rankings; see Section 15.4.4 for a different treatment of [+high] and [–high] glides in Majorcan Catalan.

As illustrated in (7) with the results for initial /w/, in the varieties under analysis *M1/GLIDE outranks INTEGRITY. This ranking rules out the selection of the fully faithful candidate, with a labiovelar glide in onset position (7a). Regarding the output place features, ID-[VEL] ensures the selection of a candidate with a velar stop as the first element in the onset (M1) and rules out other possible candidates, with a dental stop as M1, (7f), or with a labial stop as M1, (7c) and (7e). Candidate (7e) is in fact the winner in some varieties; instead, in the variety analyzed in (7) the ranking of ID-[VEL] over ID-[LAB] explains why the competition between the winning candidate (i.e., [ˈgwe.]*lo* in (7d), where the velar character is preserved in both split segments) and the candidate (7e) (i.e., [ˈbwe.]*lo*, where the labial character is instead preserved in both split segments) is resolved in favor of the former.[20] Note that ID-[VEL] is satisfied by the winning candidate, (7d), but also by the candidate with strengthening to a voiced velar stop (7b). Candidate (7b), though, incurs a fatal violation of ID-GLIDE$_{EX}$, whereas (7d) satisfies this constraint because the glide character is preserved in at least one of the two split segments.[21]

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[20] In the varieties in which [ˈbwe.lo] is selected, the opposite ranking (i.e., ID-[LAB] ≫ ID-[VEL]) applies.

[21] Throughout the paper, we disregard reinforcements with a voiceless obstruent, as in [ˈk$_1$w$_1$e.lo], which would always be ruled out by the faithfulness constraint ID-[VOICE] in favor of their voiced counterparts. Neither do we consider candidates with consonants that are absent in the inventory of each language, owing to structural constraints. For instance, a candidate with strengthening to a labiodental fricative ([ˈv$_1$e.lo]) is ruled out by the constraint *V, highly ranked in Castilian Spanish.

(7) Word-initial splitting: *huelo* [ˈgwe.lo]

/w$_1$e/lo	*M1/GLIDE	ID-[VEL]	ID-[LAB]	ID-GLIDE	ID-GLIDE$_{EX}$	INTEGRITY
a. [ˈw$_1$e.]	*!					
b. [ˈg$_1$e.]			*	*	*!	
c. [ˈb$_1$e.]		*!		*	*	
☞ d. [ˈg$_1$w$_1$e.]			*	*		*
e. [ˈb$_1$w$_1$e.]		*!		*		*
f. [ˈd$_1$w$_1$e.]		*!	*	*		*

The constraints regarding M1 in intervocalic position (see (3)) come into play in cases with splitting inside the word (*cacahuete* [ka.kaˈɣwe.te]). Hence, in the tableau in (8), we include *VSTOP$_{M1}$V ranked at the first stratum and we analyze the same candidates as in the previous tableau, but with the fricative versions of the voiced stops (except for (8g)). This is why we have also added, in a lower position, the constraints *M1/FRICATIVE and *VFRICATIVE$_{M1}$V, targeting fricatives in the suitable sites. The competition between the candidate with splitting to a velar stop as M1 (8g) and the candidate with a velar spirant fricative as M1 (8d) is solved by *VSTOP$_{M1}$V, which favors the latter. Note, finally, that the arguments adduced to explain the exclusion of other candidates in word-initial position (see (7)) also apply here.

(8) Word-internal splitting: *cacahuete* [ka.kaˈɣwe.te]

cac/aw$_{I}$e/te	*M1/GLIDE	*VSTOP$_{M1}$V	ID-[VEL]	*M1/FRIC	*VFRIC$_{M1}$V	ID-[LAB]	ID-GLIDE	ID-GLIDE$_{EX}$	INTEGRITY
a. [a.ˈw$_{I}$e.]	*!								
b. [a.ˈɣ$_{I}$e.]				*	*	*	*	*!	
c. [a.ˈβ$_{I}$e.]			*!	*	*		*	*	
☞ d. [a.ˈɣ$_{I}$w$_{I}$e.]				*	*	*	*		*
e. [a.ˈβ$_{I}$w$_{I}$e.]			*!	*	*		*		*
f. [a.ˈð$_{I}$w$_{I}$e.]			*!	*	*	*	*		*
g. [a.ˈg$_{I}$w$_{I}$e.]		*!				*	*		*

Like the labiovelar glide, /j/ is not allowed in M1 position. However, the repair strategy triggered in this case is not a splitting operation, but the reinforcement of the glide, usually via affrication in absolute word-initial position (*yugo* [ˈd͡ʝu.ɣo]) and via fricativization in intervocalic position (*mayo* [ˈma.ʝo]). The tableau in (9) illustrates the behavior of palatal glides at the beginning of the word. As shown, the constraint ID-[PAL] is crucial to prevent not only splitting (9f–g), but also other strategies, such as strengthening to a coronal stop (9d). A candidate with splitting to an affricate followed by a palatal glide (9e), which is more harmonic than the characteristics of the winning candidate in terms of faithfulness, is ruled out by the OCP constraint. Note, finally, the tight competition between the winning candidate (9c), with affrication, and the candidate (9b), with only fricativization, which is in fact an alternative realization in

some varieties. In our analysis, (9b) is ruled out because it incurs an extra violation of *M1/FRICATIVE. As said above, considering each syllable by itself, in M1 position the lower the sonority, the better; so an affricate (to which we assign the same sonority as to stops) is more harmonic than a fricative.[22]

(9) Word-initial affrication: *yugo* [ˈd͡ʝu.ɣo]

/jᵢu/go	*M1/GLIDE	ID-[PAL]	OCP	*M1/FRIC	ID-GLIDE	ID-GLIDEEX	INTEGRITY
a. [ˈjᵢu.]	*!						
b. [ˈʝᵢu.]				*!	*	*	
☞ c. [ˈd͡ʝᵢu.]					*	*	
d. [ˈdᵢu.]		*!			*	*	
e. [ˈd͡ʝᵢjᵢu.]			*!		*		*
f. [ˈgᵢjᵢu.]		*!			*		*
g. [ˈdᵢjᵢu.]		*!			*		*

[22] If we assumed that the fricative part of affricates is salient enough to classify them as fricatives in the sonority scale, candidate (9c) would incur a violation of *M1/FRIC as well, predicting the usual pattern of variation between [ˈd͡ʝu.ɣo] and [ˈʝu.ɣo]. But then, we would expect a similar pattern in intervocalic position, which is not so common. Formalizing variable cases like these would require the application of a stochastic OT model of some kind to the data, which is beyond the scope of the paper.

When the glide appears in word-internal position preceded by a vowel, the markedness constraints *VSTOP$_{M1}$V and *VFRICATIVE$_{M1}$V become relevant again. For the sake of illustration, the tableau in (10) takes into account candidates with fricatives rather than with stops. In this case, the competition between (10d), with affrication, and (10b), with fricativization, is solved in favor of the latter, because the intervocalic position favors elements with less constriction.[23]

(10) Word-internal fricativization: *mayo* [ˈma.ʝo]

m/aj$_1$o/	*M1/GLIDE	*VSTOP$_{M1}$V	ID-[PAL]	OCP	*M1/FRIC	*VFRIC$_{M1}$V	ID-GLIDE	ID-GLIDE$_{EX}$	INTEGRITY
a. [a.j$_1$o]	*!								
☞ b. [a.ʝ$_1$o]					*	*	*	*	
c. [a.ð$_1$o]			*!		*	*	*	*	
d. [a.d͡ʝ$_1$o]		*!					*	*	
e. [a.ʝ$_1$j$_1$o]				*!	*	*	*		*
f. [a.ɣ$_1$j$_1$o]			*!		*	*	*		*
g. [a.ð$_1$j$_1$o]			*!		*	*	*		*

[23] A similar approach, based on *ONSET/GLIDE, is found in Colina (2009: 18–28), who focuses only on intervocalic sequences with a palatal segment. An important difference with respect to our view is that she does not distinguish between M1 and M2 margins, so postconsonantal glides followed by a vowel (M2 in our account) must be incorporated into the nucleus in order to satisfy *ONSET/GLIDE.

The Eastern varieties of La Mancha reported in *ALeCMan* deserve special attention, because in word-initial position they exhibit splitting into a velar consonant not only with the labiovelar glide (*huelo* [ˈgwe.lo]) but also with the palatal glide (*yerno* [ˈgjer.no]). In Section 15.2.2 we mentioned that the reinforcement in [gje] is probably due to the analogical influence of words with initial /we/, with the result that the velar consonant is added instead of the usual /j/ strengthening to an affricate or a fricative. In fact, although the consonant [g] is not a prototypical correspondent of /j/, it preserves the Dorsal feature of the palatal glide. Hence, the analogical effect can be considered as the promotion of a less likely—but still natural—reinforcement (on the articulatory basis of this interpretation, see Recasens 2014: 114–16).

15.4.3 A non-adjusting variety: Central Eastern Catalan

As in Castilian Spanish, preservation without changes is the regular outcome for glides in codas (*di*[w], *re*[j]) and in the second position of onsets (*q*[w]*estió*, *miss*[j]*ó*), owing to the limited weight of *M2/GLIDE in the ranking. The main difference with respect to Spanish is that, in Central Eastern Catalan, both /w/ and /j/ tend to be maintained in simplex onsets as well ([w]*eb*, *di*[w]*en*; [j]*ogurt*, *fe*[j]*a*). Central Eastern Catalan is, in this respect, a faithful variety in which the markedness constraint *M1/GLIDE is consistently outranked by the faithfulness constraints INTEGRITY and ID-GLIDE.

The tableaux in (11) and (12) illustrate the effects of this ranking for /w/ in word-initial and in intervocalic position, respectively. Candidates with strengthening to a labiodental fricative (see (11b) and (12b)), which maintain the underlying labial

specification, have no chance of winning, because they incur a violation of ID-GLIDE. The same argument applies to candidates with strengthening to a bilabial stop and its fricative counterpart, which also preserve the underlying labial specification (see (11c) and (12c)), and candidates with strengthening to a velar stop and its fricative counterpart (see (11d) and (12d)), which are faithful to the velar specification. Candidates with splitting (see (11e) and (12e)) are even less harmonic because they violate INTEGRITY, in addition to ID-GLIDE.[24]

(11) Preservation of /w/ in word-initial position

/wɪɛ/b	INTEGRITY	ID-GLIDE	*M1/GLIDE
☞ a. [ˈwɪɛ]			*
b. [ˈvɪɛ]		*!	
c. [ˈbɪɛ]		*!	
d. [ˈgɪɛ]		*!	
e. [ˈgɪwɪɛ]	*	*!	

[24] From a diachronic point of view it makes perfect sense that splitting is not an available strategy in Catalan. Indeed, although words with stop–glide complex onsets are fully documented in Catalan, in many varieties, including Central Eastern Catalan and Majorcan Catalan, they have undergone fusion processes, as in *Quaresma* (see Section 15.3.1). Fusion is the opposite of splitting; therefore, the emergence of these structures is congruently blocked in the language.

(12) Preservation of /w/ in intervocalic position

Tableau 6 (example 12 in text)

d/iw$_1$+ə/n	INTEGRITY	ID-GLIDE	*M1/GLIDE
☞ a. [i.w$_1$ə]			*
b. [i.v$_1$ə]		*!	
c. [i.β$_1$ə]		*!	
d. [i.ɣ$_1$ə]		*!	
e. [i.ɣ$_1$w$_1$ə]	*	*!	

The palatal glide exhibits a parallel behavior to the labiovelar glide, with steady preservation in all simplex onsets. As shown in the tableaux (13) and (14), the aforementioned ranking accounts for the fully faithful mapping to [j] word-initially and intervocalically. In this case we have considered candidates with strengthening to palatal fricatives (see (13b–c) and (14b–c)) and to an affricate (see (13d) and (14d)), which fatally violate ID-GLIDE. Alternative candidates with splitting (see (13e–f) and (14e–f)) are not possible either, because they violate INTEGRITY in addition to ID-GLIDE.

(13) Preservation of /j/ in word-initial position

/j$_1$u/gurt	INTEGRITY	ID-GLIDE	*M1/GLIDE
☞ a. [j$_1$u.]			*
b. [j̠$_1$u.]		*!	
c. [ʒ$_1$u.]		*!	
d. [d͡ʒ$_1$u.]		*!	
e. [ʒ$_1$j$_1$u.]	*	*!	
f. [d͡ʒ$_1$j$_1$u.]	*	*!	

(14) Preservation of /j/ in intervocalic position

f/ɛj$_{1}$+ə/	INTEGRITY	ID-GLIDE	*M1/GLIDE
☞ a. [ɛ.j$_{1}$ə]			*
b. [ɛ.j̯$_{1}$ə]		*!	
c. [ɛ.ʒ$_{1}$ə]		*!	
d. [ɛ.d͡ʒ$_{1}$ə]		*!	
e. [ɛ.ʒ$_{1}$j$_{1}$ə]	*	*!	
f. [ɛ.d͡ʒ$_{1}$j$_{1}$ə]	*	*!	

15.4.4 A two-way adjusting variety: Majorcan Catalan

Majorcan Catalan does not differ from Central Eastern Catalan in the treatment of glides in codas and in the second position of onsets, where they are also regularly preserved (*di*[w], *re*[j]; *q*[w]*estió*, *miss*[j]*ó*). Regarding simplex onsets, however, Majorcan Catalan imposes much stronger requirements on glides than Central Eastern Catalan, but only when they are placed in intervocalic position. Indeed, while in word-initial position the two glides tend to remain unchanged ([j]*ogurt*, [w]*eb*), in intervocalic position they present two opposite fates: the labiovelar glide generally shifts into a labiodental fricative (*di*[v]*en*), whereas the palatal glide weakens to a slightly more centralized and open glide (*fe*[e̯]*a*), which may even undergo complete deletion in some varieties. In (15) we present the basic ranking of constraints for Majorcan. Since different outcomes for glides are now possible, the constraint set we take into account is larger than the one posited for Central Eastern Catalan. Furthermore, we have added ONSET to the ranking and we have introduced the distinction between [+high] and [–

high] glides ([j] and [w] are [+high]; [e̯] and [o̯] are [–high]; see Section 15.4.1, fn. 13), which becomes crucial for the changes that the palatal glide undergoes intervocalically.

(15) Constraint ranking for Majorcan Catalan:

*VSTOP$_{M1}$V ≫ *VFRICATIVE$_{M1}$V ≫*VGL$_{[+HI],\ M1}$V, INTEGRITY, ID-[LAB], ID-[PAL], ID-GLIDE, ONSET ≫ *M1/GLIDE$_{[–HI]}$, *VGL$_{[–HI],\ M1}$V ≫ *M1/GLIDE$_{[+HI]}$

For the labiovelar glide, the tableau in (16) shows how the ranking of ID-GLIDE above *M1/GLIDE$_{[+HI]}$ makes the selection of forms with strengthening strategies in word-initial position impossible (16c–e). Candidates with strengthening to a bilabial stop (16d) or to a labiodental fricative (16c), which is the actual outcome in intervocalic position, are directly ruled out by the constraint ID-GLIDE, although they satisfy the remaining constraints. Neither is the reinforcement as a velar stop (16e) possible, because of the pressure of both ID-GLIDE and ID-[LAB]. The same ranking, along with the activity of INTEGRITY, is responsible for the exclusion of candidates with splitting (16f–g). Finally, the ranking of *M1/GLIDE$_{[–HI]}$ above *M1/GLIDE$_{[+HI]}$ explains why the candidate with a [+high] glide (16a), which is less sonorous than its [–high] counterpart (16b) and thus fits better in M1, emerges as optimal.

(16) Preservation of /w/ in word-initial position

/wɪe/b	INTEGRITY	ID-[LAB]	ID-GLIDE	*M1/GLIDE[–HI]	*M1/GLIDE[+HI]
☞ a. [ˈwɪe]					*
b. [ˈo̯ɪe]				*!	
c. [ˈvɪe]			*!		
d. [ˈbɪe]			*!		
e. [ˈgɪe]		*	*!		
f. [ˈvɪwɪe]	*		*!		
g. [ˈgɪwɪe]	*	*	*!		

Almost the same scenario is found for the palatal glide in word-initial position, although in this case the relevant faithfulness constraint for place is ID-[PAL]. Note how the massive ranking of the faithfulness constraints above the markedness constraints enforces the selection of the fully faithful candidate as optimal again (17a).

(17) Preservation of /j/ in word-initial position

/jɪo/gurt	INTEGRITY	ID-[PAL]	ID-GLIDE	*M1/GLIDE[–HI]	*M1/GLIDE[+HI]
☞ a. [jɪo.]					*
b. [e̯ɪo.]				*!	
c. [ɟɪo.]			*!		
d. [ʒɪo.]			*!		
e. [d͡ʒɪo.]			*!		
f. [dɪo.]		*	*!		
g. [d͡ʒɪjɪo.]	*		*!		
h.[dɪjɪo.]	*	*	*!		

In intervocalic position, the analysis is a challenge, because, as we have said, two contradictory outcomes are found: strengthening and weakening. For expository reasons, we start the analysis with the intervocalic palatal glide. As shown in (18), the relevant competition is established here between the fully faithful candidate (18a) and the candidate with weakening to a slightly more centralized and open glide, that is, to a glide specified as [–high] (18b). As placed in an intervocalic onset, where more sonorous segments are preferred, low-ranked *VGL$_{[+HI],\,M1}$V solves the tie by rejecting the candidate with the less open version of the glide (18a).[25] Additionally, a candidate with total deletion, (18i), is ruled out by ONSET, crucially ranked above *M1/GLIDE$_{[–HI]}$ and *VGL$_{[–HI],\,M1}$V. An opposite ranking of these constraints would predict the choice of the candidate with deletion instead. As shown in Section 15.3.2, /j/-deletion is in fact an attested solution in Majorcan Catalan, which Recasens and Espinosa (2005: 26–9) associate precisely with the particularly low variants of the intervocalic palatal glide.[26]

[25] The selection of (18b) indicates that *VGL$_{[+HI],\,M1}$V dominates the faithfulness constraint prohibiting changes in height for glides, ID-[HI]. Inversely, the general maintenance of high glide variants in codas and in the second position of onsets (i.e., in M2), where less constricted segments are also favored, shows that ID-[HI] is above the constraint banning [+high] glides in M2 position, *M2/GLIDE$_{[+HI]}$ (see (20)).

[26] In postlexical sequences, word-initial /j/ is realized as [j] when appearing in intervocalic position: e.g., *menja* [j]*ogurt* ‘he eats yogurt’, whereas word-final /j/ is lowered when preceding a vowel-initial word: e.g., *ma*[e̯] *umpl* ‘I never fill’ (Dols 2000: 260). Whatever formalization we adopt to justify the maintenance of word-initial [j], its

Finally, the tableau also illustrates how the high ranking of the constraints *VSTOP$_{M1}$V and *VFRICATIVE$_{M1}$V rules out strengthening strategies involving fricativization or affrication, which are the usual outcomes in Castilian Spanish.

(18) Weakening of /j/ in word-internal position

f/əj$_1$+ə/	*VSTOP$_{M1}$V	*VFRICATIVE$_{M1}$V	*VGL$_{[+HI],\,M1}$V	INTEGRITY	ID-[PAL]	ID-GLIDE	ONSET	*M1/GLIDE$_{[-HI]}$	*VGL$_{[-HI],\,M1}$V	*M1/GLIDE$_{[+HI]}$
a. [ə.j$_1$ə]			*!							*
☞ b. [ə.e̯$_1$ə]								*	*	
c. [ə.j̞$_1$ə]		*!				*				
d. [ə.ʒ$_1$ə]		*!				*				
e. [ə.ð$_1$ə]		*!			*	*				
f. [ə.d͡ʒ$_1$ə]	*!					*				
g. [ə.d$_1$ə]	*!				*	*				
h. [ə.ʒ$_1$j$_1$ə]		*!		*		*				
i. [ə.ə]							*!			

The ranking established for the palatal glide in (18) has undesirable consequences for the labiovelar glide in intervocalic position, since a parallel form with a [–high] glide (e.g., *diuen* [ˈdi.o̯ən]) would indefectibly enter the competition and be erroneously

preservation must be related to the special salience of the left margin of the word (see, e.g., Barnes 2006).

selected as optimal. Interestingly enough, the deletion of /w/ is documented in the Majorcan varieties that do not show strengthening to [v] when root-final labiovelar glides are preceded by a labial vowel and followed by a vowel-initial affix, where the labial feature of /w/ is still preserved in the previous vowel (e.g., *bouet* [boˈət]; see Section 15.3.1). Thus, if we presume that these deletions follow a previous stage with lowering of the labiovelar glide, we can draw a parallelism between the behavior of the palatal glide and that of the labiovelar glide in intervocalic onsets, resulting from the same ranking in (18).

However, as stated in Section 15.3.1, the most common realization of *diuen* is [ˈdi.vən], with a labiodental fricative.[27] This outcome runs into problems with the ranking proposed to account for the weakening of the palatal glide. The presence of *VFricative$_{M1}$V above *VGl$_{[+Hi],\ M1}$V, and thus outranking *VGl$_{[–Hi],\ M1}$V, would enforce the selection of a candidate with a [–high] labiovelar glide. To deal with this issue, we assume that the underlying representation of forms showing the alternation [w] ~ [v] (as *di*[w] ~ *di*[v]*en*) displays two allomorphs, one with the labiovelar glide and the other with the labiodental fricative. Moreover, we presume that the two allomorphs appear with the lexical precedence 'fricative>glide', as in {/div/>/diw/} for the root of *diuen* (on lexically ordered allomorphs, see Bonet, Lloret, and Mascaró 2007, and Mascaró 2007). There are some empirical arguments that support this allomorphic approach. First, the strengthening of the labiovelar glide in intervocalic position is a dubiously productive process, since loans or learned words such as *Hawaii*,

[27] Recall from Section 15.3.1 that, in the varieties that present [v] in *diuen* (i.e., [ˈdi.vən]), the intervocalic segment in words as *bouet* is regularly realized as a labiodental fricative as well (i.e., [boˈvət]).

Power, or *PowerPoint* are realized with [w]. Second, this strengthening is not common in word-initial position, where it would be more justifiable (see (16)) because the affected segment is not preceded by a vowel. There is also an independent argument for giving precedence to the fricative: the labiodental fricative is the variant appearing in onset position, which, as known, is a neutral position that favors faithfulness and thus avoids alterations (Beckman 1999).

In the grammar of these varieties, the preference for the dominant allomorph is ensured by the PRIORITY constraint: "Respect lexical priority (ordering) of allomorphs" (Bonet, Lloret, and Mascaró 2007: 902; Mascaró 2007: 726). In (19) we analyze the results for *diuen* /{/div/$_1$> /diw/$_2$}+ən/. For simplicity, we present the candidates containing an intervocalic [w] or an even smoother transition between the adjacent vowels as derived from the second-choice allomorph (i.e., /diw/$_2$; see (19c–d)), and the candidate containing the labiodental fricative [v] as derived from the first allomorph (i.e., /div/$_1$; see (19a)). Candidates with a glide are faithful to the second allomorph (19b–c), but are discarded in favor of the candidate derived from the first allomorph (19a), which satisfies PRIORITY. This constraint rules out a candidate with deletion as well, because this candidate is assumed to derive from the intervocalic weakening of the glide present in the second input allomorph (19d).[28]

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[28] Other mappings that are superficially identical to the candidates in (19) are also correctly rejected by the grammar. For instance, the mapping [ˈdi.vən]$_2$, phonetically identical to (19a) but with reinforcement of the glide from the second allomorph, is ruled out by PRIORITY. On the other hand, mappings related to /div/$_1$ in which /v/ undergoes a reduction in constriction (i.e., [ˈdi.wən]$_1$, [ˈdi.o̯ən]$_1$) or is completely deleted (i.e., [ˈdi.ən]$_1$) could never win, because the unaltered outcome of roots with /v/

(19) Selection of a labial fricative [v] in intervocalic position

/{div$_1$ > diw$_2$}+ən/	PRIORITY	*VFRICATIVE$_{M1}$V	*VGL$_{[+HI], M1}$V	ID-GLIDE	ONSET	*M1/GLIDE$_{[–HI]}$	*VGL$_{[–HI], M1}$V	*M1/GLIDE$_{[+HI]}$
☞ a. [ˈdi.vən]$_1$		*						
b. [ˈdi.wən]$_2$	*!		*					*
c. [ˈdi.o̯ən]$_2$	*!					*	*	
d. [ˈdi.ən]$_2$	*!				*			

In coda position, instead, segments of higher sonority are strongly preferred, owing to the pressure of the *M2/λ hierarchy. If we assume that *M2/FRICATIVE has a prominent position in the ranking, just above PRIORITY, the faithful mapping of the first allomorph /div/$_1$ (20a) is ruled out.[29] The best coda in terms of sonority, i.e., the nonhigh glide in (20c), is ruled out because it changes the high specification of the second allomorph, an outcome excluded by the position of ID-[HI] above *M2/GLIDE$_{[+HI]}$ in the ranking.

located intervocalically (e.g., *rovell* [roˈvəj] ‘yolk’) reveals that /v/ is never weakened in that position. (The maintenance of intervocalic /v/ is most likely due to the action of faithfulness constraints demanding the preservation of the labiodental consonant and its fricative character crucially ranked above *VFRICATIVE$_{M1}$V.)

[29] As in (19), we present only candidates containing [w] or a segment of higher sonority derived from /diw/$_2$, and the candidate containing the labiodental fricative [v] derived from /div/$_1$.

Therefore, the fully faithful mapping of the second allomorph is chosen because it yields the most unmarked coda still available (20b).[30]

[30] Dols (2000) suggests that roots displaying the alternation [v] ~ [w] contain a /V/ archiphoneme (specified as Labial, [+voice], [+continuant]), which is realized either as [v] (in onsets) or as [w] (in codas). In our analysis, though, if [v] ~ [w] were equally faithful mappings of /V/, the reluctance to having fricatives in intervocalic onsets (owing to *VFRICATIVE$_{M1}$V; see (19)) and in codas (owing to *M2/FRICATIVE; see (20)) would lead to the systematic selection of the least constricted variant of the underspecified segment (namely, [w]). Alternatively, we might consider that the underlying representation for these forms is /v/ (as proposed by Wheeler 2005), and derive the weakening to [w] in coda position from the *M2/λ hierarchy (i.e., from *M2/FRICATIVE). This analysis is not supported by the behavior of /v/ in verbs such as *llevar* 'to take away', *cavar* 'to dig', or *provar* 'to prove', in which [v] in intervocalic onsets (cf. *lle*[v]*ar*, *ca*[v]*ar*, *pro*[v]*ar*) alternates in most varieties with the voiceless fricative counterpart in word-final position, as in the first singular present indicative forms *lle*[f], *ca*[f], *pro*[f] (see Bibiloni 1983). In our proposal, these verbal forms need only a single stem-allomorph, with final /v/, which is either mapped faithfully in onsets or devoiced, just like the other obstruents, in final codas.

(20) Selection of the labiovelar glide [w] in coda position

/{div$_1$ > diw$_2$}/	*M2/FRICATIVE	PRIORITY	ID-GLIDE	ID-[HI]	*M2/GLIDE$_{[+HI]}$	*M2/GLIDE$_{[-HI]}$
a. [ˈdiv]$_1$	*!					
☞ b. [ˈdiw]$_2$		*			*	
c. [ˈdio̯]$_2$		*		*!		*

15.5 Conclusion

In this chapter we bring together data from several varieties of Catalan and Spanish to investigate the divergent behavior of glides in onsets and codas. Our account of the data gives support to the distinction proposed by Baertsch (2002) between elements that are parsed as the leftmost element in the onset (M1) and elements that are syllabified as codas or as the second element in the onset (M2). Additionally, we demonstrate that glide phonotactics requires, in addition to the reference to independent syllables that Baertsch's (2002) split-margin hierarchy provides, the consideration of segmental strings so as to incorporate the effects of the surrounding context into the analysis. A broader implication of the study is that glides constitute an important testing ground for the evaluation of competing tendencies appearing in languages to adjust markedness sonority requirements to faithfulness conditions. Finally, the optimality-theoretic approach presented here illustrates how the model is capable of deriving the whole typology of outcomes from the same constraint set, even when enriched multi-input representations are needed (as in the case of ordered allomorphs in Majorcan Catalan).

Acknowledgments

This research was supported by the Spanish Ministry of Economy and Competitiveness (project number FFI2013-46987-C3-1-P: www.ub.edu/GEVAD) and by the Catalan Government (research group 2014SGR918). Previous insights on this topic were presented at the *X Congreso Internacional de Lingüística General*, Zaragoza 2012, and at the *XXVI Col·loqui Internacional de l'Associació de Llengua i Literatura Catalanes*, Salamanca 2012 (see Jiménez and Lloret 2013 and 2015, respectively). We thank Javier Caro and the anonymous reviewers for their useful comments.

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