Enclitic-induced stress shift in Catalan[1]

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Abstract: In this paper we provide a novel and unified formal analysis of the stress microvariation found in verb-enclitic groupings in Barcelona Catalan, with stress stability, in Formentera Catalan, with stress shift to the penultimate and the last syllable of the whole sequence, and in Mallorca and Menorca Catalan, with stress shift to the last syllable. We argue that stress shift in Formentera Catalan conforms directly to the unmarked pattern of nominal stress in Catalan, that is, a right-aligned moraic trochee, with the constraint ALL-FEET-RIGHT undominated, leading to final and penultimate stress. In Barcelona Catalan, the effects of this constraint are inhibited by an anti-alignment constraint prohibiting the right edge of a foot from coinciding with the right edge of a clitic. In Mallorca and Menorca Catalan, stress shift is also understood as a strategy to meet the unmarked nominal stress pattern of Catalan, although in these dialects the anti-alignment constraint is also undominated, leading to catalexis, in this case a melodically empty mora, and thus to final stress.

Keywords: Catalan; clitics; stress; stress shift.

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1. INTRODUCTION

Clitics in general, and clitic pronouns specifically, raise a number of research questions at various levels of analysis. One of these questions is how these elements interact with prosodic units such as the foot or the prosodic word, and how from this interaction a particular stress configuration is attained.

At the empirical level, this paper aims to present an exhaustive description of the typology of stress patterns of verb-enclitic groupings found in Catalan varieties, with the special emphasis on those that are stress-shifting. At the theoretical level, this paper is intended to address the longstanding problem of how grammatical elements, in this case pronominal enclitics, are organised prosodically. The existing formal analyses of the phonology of pronominal enclitics in Catalan are limited in scope and far from exhaustive, in the sense that they do not consider the totality of stress patterns found in this linguistic area (see, for instance, Grimalt 2002, 2004, restricted to Mallorca and Menorca Catalan). A comprehensive picture of the kind presented here, we argue, is crucial in order to provide an accurate and unified formal analysis.

The focus of the present research is drawn from two main Catalan varieties that show a distinct stress behaviour in encliticisation: Barcelona Catalan and Balearic Catalan (spoken in an archipelago in the western Mediterranean sea). The latter is of particular interest because it has developed a set of stress patterns that diverge in many respects from other Romance varieties (including the rest of Catalan dialects, with the exception of North-Eastern Catalan). The prosodic properties of pronominal enclitics in Balearic Catalan are indeed intriguing, as they are stress-shifting. Although stress-shifting or stressable pronominal enclitics have already been reported in other Romance varieties, mainly in Italo-Romance (Kenstowicz 1991, Bafile 1994, Peperkamp 1997, Moyna 1999, Loporcaro 2000, Ordóñez & Repetti 2006, 2014), the patterns found in Balearic Catalan constitute a rich new empirical field for theoretical exploration, because of both their singularity within the Romance space and their internal regularity, and also because of the stress microtypology they embody.

In order to contextualise these patterns and their theoretical relevance, we briefly present the stress facts related to encliticisation. As illustrated in (1), Formentera Catalan shows stress shift to the penultimate and the last syllable of the whole sequence (1a), Barcelona Catalan is characterised by stress stability with respect to the isolated verbal forms (1b), and Mallorca and Menorca Catalan present stress shift to the last syllable (1c), although in Menorca Catalan paradigmatic pressure effects can lead to penultimate stress in some specific combinations (1diii).

(1) Stress patterns [1]

(a) Stress shift in Formentera Catalan

(i)	[ˈkan.tə]	‘sing-2SG.IMP’	*cf.*	[kən.ˈtəl]	‘sing-2SG.IMP. it-3SG.MASC’
(ii)	[ˈdo.nə]	‘give-2SG.IMP.’	*cf.*	[du.ˈnə.li]	‘give-2SG.IMP to him/her’
(iii)	[ˈmɔs.trə]	‘show-2SG.IMP’	*cf.*	[mus.trə.ˈmə.lə]	‘show-2SG.IMP. it-3SG.F to me’

(b) Stress stability in Barcelona Catalan

(i)	[ˈkan.tə]	‘sing-2SG.IMP’	*cf.*	[ˈkan.təl]	‘sing-2SG.IMP. it-3SG.MASC’
(ii)	[ˈdo.nə]	‘give-2SG.IMP.’	*cf.*	[ˈdo.nə.li]	‘give-2SG.IMP to him/her’
(iii)	[ˈmɔs.trə]	‘show-2SG.IMP’	*cf.*	[ˈmɔs.trə.mə.lə]	‘show-2SG.IMP. it-3SG.F to me’

(c) Stress shift in Mallorca Catalan

(i)	[ˈkan.tə]	‘sing-2SG.IMP’	*cf.*	[kən.ˈtəl]	‘sing-2SG.IMP. it-3SG.MASC’
(ii)	[ˈdo.nə]	‘give-2SG.IMP.’	*cf.*	[do.nə.ˈli]	‘give-2SG.IMP to him/her’
(iii)	[ˈmɔs.trə]	‘show-2SG.IMP’	*cf.*	[mos.trə.lə.ˈmə]	‘show-2SG.IMP. it-3SG.F to me’

(d) Stress shift in Menorca Catalan

(i)	[ˈkan.tə]	‘sing-2SG.IMP’	*cf.*	[kən.ˈtəl]	‘sing-2SG.IMP. it-3SG.MASC’
(ii)	[ˈdo.nə]	‘give-2SG.IMP.’	*cf.*	[du.nə.ˈli]	‘give-2SG.IMP to him/her’
(iii)	[ˈmɔs.trə]	‘show-2SG.IMP’	*cf.*	[mus.trə.ˈmə.lə]	‘show-2SG.IMP. it-3SG.F to me’

In this paper, we show that all patterns of stress shift in Balearic Catalan are in fact motivated by the choice of the unmarked foot type of Catalan,

[1] Although not fully illustrated in this set of examples, stress shift under encliticisation is clear from vowel reduction of the stressed vowel in the stem: stressed [ˈe], [ˈɛ], and [ˈa] in the stem of the isolated verbal form alternate with [ə] in the stem of the encliticised verbal form in all varieties under study, and, under the same circumstances, stressed [ˈo] and [ˈɔ] alternate with [u] in Barcelona Catalan, Formentera Catalan and Menorca Catalan, and with [o] in Mallorca Catalan (see also Nadeu et al. 2016 for phonetic evidence of stress shift in Mallorca Catalan encliticisation). Throughout the paper, we use the symbol ‘.’ to indicate a syllable boundary, the symbol ‘#’ to indicate the boundary between the clitic and the verb, or the boundary between two clitics, in underlying representations, and the symbol ‘+’ to indicate a morphological boundary, also in underlying representations. For previous work on the syllabification of Catalan clitics, see Bonet & Lloret (2002, 2005); Jiménez & Todolí (1995); Wheeler (2005).

which is a right-aligned moraic trochee. Specifically, we argue that stress shift in Formentera Catalan conforms directly to the unmarked nominal stress system of Catalan, that is, a right-aligned moraic trochee, with the constraint ALL-FEET-RIGHT undominated, leading to final and penultimate stress. In Barcelona Catalan, the effects of this constraint are inhibited by an anti-alignment constraint prohibiting the right edge of a foot from coinciding with the right edge of a clitic. In Mallorca and Menorca Catalan, stress shift is also understood as a strategy to meet the unmarked stress system of Catalan but in which the anti-alignment constraint is also undominated, leading to catalexis, in this case a melodically empty mora, and thus to final stress.

The theoretical model for this research falls within metrical stress theory as developed in Hayes (1995) in its application to Optimality Theory (OT) (see McCarthy and Prince 1993a and subsequent work). The formal analysis presented in the paper covers only and exclusively second singular imperatives and infinitives, but the same analysis of infinitives can be extended to second plural imperatives when followed by an enclitic. This is so because both second plural imperatives and infinitives end in a consonant and behave the same with respect of stress assignment.

The outline of the paper is as follows. In §2 the stress shift data under encliticisation is presented. The analysis of both the basic stress pattern in Catalan nominal forms and of verb-enclitic groupings is developed in §3. §4 is devoted to discussing alternative and previous analyses of the Balearic Catalan data. §5 concludes the paper.

2. DATA

The empirical interest of this paper lies in the stress patterns concerning verb-enclitic groupings in the varieties of Catalan spoken in Barcelona and on the islands of Formentera, Mallorca and Menorca (to which we refer as Balearic Catalan, in the event of coincidence of behaviour). In most Catalan varieties, pronominal encliticisation is found with positive imperative, infinitive, and gerund

forms of verbs of any conjugational class (e.g. Bonet 2002). However, Mallorca and Menorca Catalan show an apparent reluctance to enclisis with gerund verbal forms, for which speakers resort to alternative syntactic structures, or with 3SG imperative forms, for which they resort to proclisis (e.g. Dols 2000, Grimalt 2002; and personal observations). This is why we exclude these kinds of combination from the general analysis; we also exclude 1PL imperative forms, which are difficult to elicit in the same varieties. For expository reasons, we concentrate on enclisis with first conjugation verbal forms, whose infinitive ends in *-ar*, because this is the most regular class. Encliticisation with verbs of the second and the third conjugational classes show the same stress patterns, but in most varieties the stems of these verbs are exposed to an allomorphic behaviour and to some irregularities, both unrelated to stress, that might slow down the overall analysis unnecessarily (e.g. Bonet 2002, Bonet & Torres-Tamarit 2010, 2011). It is beyond the scope of this paper to discuss the underlying representation of pronominal clitics and the shape they acquire depending on their position and the phonological context in which they appear, features which have been extensively described in previous work by Wheeler (1979:141–190), Viaplana (1980), Mascaró (1985:131), Bonet (1992, 1995, 2002), Bonet & Lloret (1998, 2005), among many others.

In the three following subsections, we present the basic stress patterns found in Barcelona Catalan (§2.1), Formentera Catalan (§2.2), and Mallorca and Menorca Catalan (§2.3). Our data are drawn from two basic sources. The first source is the previous literature devoted to encliticisation in Catalan varieties, which includes work by Bonet (1992, 1995, 2002), mainly focused on Central Catalan; work by Torres-Tamarit (2008), focused on Formentera Catalan and based on personal inquiries on the ground, and work by Moll (1932, 1934), Bibiloni (1983) and Grimalt (2002, 2004). The second source comprises our own personal interviews with 3 speakers from Mallorca, Menorca and Formentera. These data was elicited through a translation task from Spanish to Catalan and in some cases through a questionnaire including daily life situations in which we asked speakers to give an order to a relative.

2.1. Stress patterns in Barcelona Catalan encliticisation

In the variety of Catalan spoken in Barcelona, as in most Catalan varieties, the adjunction of pronominal enclitics to 2SG imperative and infinitive verbal forms involves a preservation of the position the stress has in the isolated verbal form (e.g. Bonet 2002); namely, there is no stress shift.[2] With 2SG imperative forms, which have a paroxytonic structure ending in a vowel when occurring in isolation, the adjunction of the clitic leads to proparoxytonic (2ai) or preproparoxytonic structures (2aii). With infinitive forms, which have an oxytonic structure ending in a vowel when occurring in isolation, the adjunction of the clitic may lead to paroxytonic structures ending in a vowel (2bi), unless there is a combination of two clitics that form two syllables, in which case the result is a proparoxytonic structure ending in a vowel (2bii).[3] In Romance languages, this behaviour of stress stability is documented in Spanish and in Standard Italian (e.g. Loporcaro 2000, Ordóñez & Repetti 2006).

(2) Penultimate and antepenultimate stress in Barcelona Catalan

	(a) 2SG.IMP+Cl	(b) INF+Cl	
	/kompɾ+ə/	/kompɾ+a+ɾ/	buy-2SG.IMP/buy-TV-INF
	[ˈkom.pɾə]	[kum.ˈpɾa]	
(i)	[ˈkom.pɾə.lə]	[kum.ˈpɾar.lə]	3SG.F.ACC
(ii)	[ˈkom.pɾə.mə.lə]	[kum.ˈpɾar.mə.lə]	1SG.DAT+3SG.F.ACC

2.2. Stress patterns in Formentera Catalan encliticisation

In Formentera Catalan, encliticisation triggers stress shift. In the combinations of verb plus enclitic(s) ending in a consonant, the stress falls on the last syllable

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[2] See, however, Todolí (1988), where patterns with stress shift in Valencian Catalan varieties are reported.

[3] Note how the /ɾ/ corresponding to the infinitive morph undergoes a process of deletion in absolute word-final position, as do most rhotic segments when placed in this position and preceded by a stressed vowel ([fustəˈɾiə] 'carpentry' ~ [fusˈte] 'carpenter'; [dəˈreɾə] 'latest-F' ~ [dəˈre] 'latest-M'). This process does not apply at the boundary between a verb and an enclitic, and this is why it has been argued that clitics behave as affixes in Catalan (see Mascaró 1986 and Bermúdez-Otero 2011).

(3aii,vi-viii). In the combinations of verb plus enclitic(s) ending in a vowel, the stress falls on the penultimate syllable (3aiii-v). When two enclitics are attached to the verbal form, stress always falls on the first one; again, final stress is obtained if the second enclitic is consonant-final (3aix) and penultimate stress is obtained if the second enclitic is vowel-final (3ax,xi). Encliticisation after infinitive forms does not cause stress shift if one enclitic is attached (3bii-viii); in the presence of two enclitics, final or penultimate stress is obtained depending on whether the last enclitic is consonant- or vowel-final (3bix-xi). This pattern consistently applies throughout all conjugations and irrespective of the clitic pronoun (see Torres-Tamarit 2008; Bonet & Torres-Tamarit 2010, 2011). In the Romance language area, penultimate stress has been identified in some varieties of Lucanian, and in some varieties spoken in Naples, although in the latter case penultimate stress is circumscribed to combinations of two clitics and the host preserves secondary stress (Peperkamp 1997). Note, in this respect, that in Formentera Catalan the occurrence of verb-enclitic groupings with a final consonant (3aii,vi-ix) also gives rise to oxytonic structures and that the verbal base does not carry stress, either primary or secondary, as evidenced by vowel reduction of the mid back vowel /o/ to the high back vowel [u] ([ˈkom.prə] 'buy-2SG.IMP' ~ [kum.ˈpra] 'buy-INF'), a general feature of Eastern Catalan dialects.

(3) Final stress and penultimate stress in Formentera Catalan

	(a) 2SG.IMP+Cl	(b) INF+Cl	
	/kompɾ+ə/	/kompɾ+a+ɾ/	buy-2SG.IMP/buy-TV-INF
(i)	[ˈkom.pɾə]	[kum.ˈpɾa]	
(ii)	[kum.ˈpɾəl]	[kum.ˈpɾal.lu]	3SG.M.ACC
(iii)	[kum.ˈpɾə.lə]	[kum.ˈpɾal.lə]	3SG.F.ACC
(iv)	[kum.ˈpɾə.li]	[kum.ˈpɾal.li]	3SG.DAT
(v)	[kum.ˈpɾəl.zi]	[kum.ˈpɾal.zi]	3PL.DAT
(vi)	[kum.ˈpɾən]	[kum.ˈpɾaɾ.nə]	PART
(vii)	[kum.ˈpɾəw]	[kum.ˈpɾa.ɾu]	ACC.N
(viii)	[kum.ˈpɾəj]	[kum.ˈpɾa.ɾi]	LOC
(ix)	[kum.pɾə.ˈməl]	[kum.pɾəɾ.ˈməl]	1SG.DAT+3SG.M.ACC
(x)	[kum.pɾə.ˈmə.lə]	[kum.pɾəɾ.ˈmə.lə]	1SG.DAT+3SG.F.ACC
(xi)	[kum.pɾə.ˈmu.zu]	[kum.pɾəɾ.ˈmu.zu]	1PL.DAT.+ACC.N

2.3. Stress patterns in Mallorca and Menorca Catalan encliticisation

In most varieties of Mallorca Catalan, encliticisation also triggers stress shift, but in this case the stress always falls on the last syllable of the whole verb-enclitic grouping (4a,b), either when the verb-clitic grouping ends in a vowel, a consonant, or when there is a combination of two clitics (Moll 1934, Bibiloni 1983, Grimalt 2002). Menorca Catalan shows the same stress patterns as Mallorca Catalan, although in the combinations of 1SG and 2SG.DAT plus 3SG.F.ACC clitics, stress unexpectedly falls on the penultimate syllable ([kum.ˈpɾə.lə], [kum.pɾə.ˈmə.lə]) (Moll 1932). Interestingly enough, some Mallorca Catalan varieties (for instance, Llucmajor and Sóller) show the same behaviour as Menorca Catalan (Grimalt 2002) under the same kind of combinations. The behaviour of Mallorca and Menorca Catalan, with stress on the last syllable, is analogous to that found in North-Eastern Catalan, where, however, enclisis is only possible with imperative forms (Veny 1982; Gómez Duran 2011), in Gascon Occitan, in some varieties

of Sardinian (see, however, Kim and Repetti 2013), and in Viozene Piedmontese (e.g. Ordóñez & Repetti 2006). Note, finally, that the verbal base does not carry stress, either primary or secondary, although in some varieties of Mallorca Catalan a lack of vowel reduction has been documented (the [a] in [mi.raw.ˈmə] does not reduce to schwa 'look-2PL.IMP at me') (Bibiloni 1983).[4] The general situation, though, is vowel reduction whenever a verbal form is followed by enclitics. In the examples in (6), /o/ vacuously reduces to [o] because in Mallorca Catalan /ɔ, o/ reduce to [o] but not to [u].

(4) Final stress in Mallorca Catalan[5]

	(a) 2SG.IMP+Cl	(b) INF+Cl	
	/kompɾ+ə/	/kompɾ+a+ɾ/	buy-2SG.IMP/buy-TV-INF
(i)	[ˈkom.pɾə]	[kom.ˈpɾa]	
(ii)	[kom.ˈpɾəl]	[kom.pɾəl.ˈlo]	3SG.M.ACC
(iii)	[kom.pɾə.ˈlə]	[kom.pɾəl.ˈlə]	3SG.F.ACC
(iv)	[kom.pɾə.ˈli]	[kom.pɾəl.ˈli]	3SG.DAT
(v)	[kom.pɾəl.ˈzi]	[kom.pɾəl.ˈzi]	3PL.DAT
(vi)	[kom.ˈpɾən]	[kom.pɾən.ˈnə]	PART
(vii)	[kom.ˈpɾəw]	[kom.pɾə.ˈɾo]	ACC.N
(viii)	[kom.ˈpɾəj]	[kom.pɾə.ˈɾi]	LOC
(ix)	[kom.pɾəl.ˈmə]	[kom.pɾəl.ˈmə]	3SG.M.ACC+1SG.DAT
(x)	[kom.pɾə.lə.ˈmə]	[kom.pɾəl.lə.ˈmə]	3SG.F.ACC+1SG.DAT
(xi)	[kom.pɾə.mo.ˈzo]	[kom.pɾəm.mo.ˈzo]	1PL.DAT+ACC.N

[4] Lack of vowel reduction can be due to phonological faithfulness to the verbal form without the enclitic(s) rather than to metrical prominence, as happens in the first members of compounds in Catalan, which do not show vowel reduction and are unstressed.

[5] Note how /ɾ/, corresponding to the infinitive morph, assimilates totally to the following consonant, which belongs to the clitic. For the patterns relative to assimilation in Mallorca and Menorca Catalan, see Pons-Moll (2004, 2007, 2011).

3. ANALYSIS

In this section, we develop a proposal for the stress patterns found in verb-enclitic groupings in Catalan varieties framed within OT. Since the proposal is an attempt to conform the encliticisation stress patterns to the unmarked nominal stress system found in Catalan, first we introduce the basic mechanisms that rule stress in this language and their implementation inside the OT machinery (§3.1). We then expand this implementation so it is able to account for the stress patterns found in encliticisation (§3.2).

3.1. Basic stress patterns in Catalan

In Catalan, words can bear stress on the last, the penultimate or the ante-penultimate syllable. Although the position of stress is not always predictable, since additional morphological and lexical factors can interfere, the patterns summarized in (5) are the ones identified as the unmarked in the Catalan stress system for nominal elements (see, among others, Serra 1996, 2002, Vallverdú 1997). As can be seen in (5), the general tendency is that words ending in a vowel are paroxytonic (5a), and that words ending in a consonant are oxytonic (5b), regardless of whether the vowel belongs to the stem or is an inflectional gender marker. According to Serra (1996), this pattern, which is found in all varieties under study, accounts for almost 86% of the entire lexicon (inflected word forms), and applies to monomorphemic and inflected nominal elements. For the sake of simplicity, the phonetic transcriptions in (5) and (6) correspond to Barcelona Catalan. The stress patterns illustrated, though, are valid for all the varieties under analysis. In the examples below, final vowels are either part of the root (*ciri* 'altar candle' cf. *ciri-et* 'altar candle-DIM') or gender markers (*bigot+i* 'moustache' cf. *bigot-et* 'moustache-DIM'); in both cases, stress is assigned identically.

(5) Unmarked stress patterns in Catalan nominal forms

(a) Penultimate stress in vowel-final words

(i)	*ciri*	[ˈsi.ɾi]	‘altar candle’
(ii)	*negoci*	[nə.ˈɣɔ.si]	‘business’
(iii)	*canari*	[kə.ˈna.ɾi]	‘canary’
(iv)	*matrimoni*	[mə.tɾi.ˈmɔ.ni]	‘marriage’
(v)	*indi*	[ˈin.di]	‘Indian’
(vi)	*taxi*	[ˈtak.si]	‘taxi’
(vii)	*muntany+a*	[mun.ˈta.ɲa]	‘mountain’
(viii)	*bigot+i*	[bi.ˈɣɔ.ti]	‘moustache’

(b) Final stress in consonant-final words

(i)	*compàs*	[kum.ˈpas]	‘compass’
(iv)	*palau*	[pə.ˈlaw]	‘palace’
(v)	*almanac*	[əl.mə.ˈnak]	‘almanac’
(vi)	*petit*	[pə.ˈtit]	‘small’
(vii)	*nacion+al*	[nə.sju.ˈnal]	‘national’
(viii)	*bon+dat*	[bun.ˈdat]	‘goodness’
(ii)	*consist+ent*	[kun.sis.ˈten]	‘consistent’
(iii)	*conseqü+ent*	[kun.sə.ˈkwen]	‘consequent’

There are, however, some deviations from these general patterns. First, some words ending in a consonant are paroxytonic (6a); of these, a significant proportion corresponds to derived words with prestressing suffixes (6aiii,iv) (see Mascaró 1976, 2003, Pons-Moll 2014). Second, some words ending in a vowel are unexpectedly oxytonic (6b); among these, it is important to distinguish between words ending in an underlying word-final /n/ or /ɾ/ (which do not surface because of the application of the general processes of /n/ and /ɾ/ word-final deletion after stressed vowels in most varieties (6bi-iv)), and words strictly ending in a vowel, which in most (though not all) cases correspond to loanwords and learned words (6bv-viii) (note the lack of derived forms, which reinforces their status as loanwords). Third, there are words with antepenultimate

stress, ending either in a vowel or in a consonant (6c), and which are either monomorphemic (6ci-vi) or heteromorphemic (6cvii,viii). With respect to this last group, however, it is important to highlight that there are no proparoxytonic words whose penultimate syllable is closed, except for a few loanwords, such as *Manchester* or *Washington*.

(6) Marked stress patterns in Catalan nominal forms

(a) Penultimate stress in consonant-final words

(i)	*capítol*	[kə.ˈpi.tul]	‘chapter’
(ii)	*llapis*	[ˈʎa.pis]	‘pencil’
(iii)	*numèr+ic*	[nu.ˈmɛ.ɾik]	‘numerical’
(iv)	*cinè+fil*	[si.ˈnɛ.fil]	‘cinephile’

(b) Final stress in vowel-final words

(i)	*català*	[kə.tə.ˈla]	‘Catalan-M’	(cf. [kə.tə.ˈla.nə]	‘Catalan-F’)
(ii)	*comú*	[ku.ˈmu]	‘common-M’	(cf. [ku.ˈmu.nə]	‘common-F’)
(iii)	*fuster*	[fus.ˈte]	‘carpenter’	(cf. [fus.tə.ˈɾi.ə]	‘carpentry’)
(iv)	*tabú*	[tə.ˈβu]	‘taboo’		
(v)	*ximpanzé*	[ʃim.pən.ˈze]	‘chimpanzee’		
(vi)	*cafè*	[kə.ˈfɛ]	‘coffee’	(but [kə.fə.ˈtɛt]	‘coffee.DIM’)
(vii)	*peroné*	[pə.ɾu.ˈne]	‘fibula’		

(c) Antepenultimate stress

(i)	*Trípoli*	[ˈtɾi.pu.li]	‘Tripoli’
(ii)	*metròpoli*	[mə.ˈtɾɔ.pu.li]	‘metropolis’
(iii)	*pàgina*	[ˈpa.ʒi.nə]	‘page’
(iv)	*música*	[ˈmu.zi.kə]	‘music’
(v)	*Júpiter*	[ˈʒu.pi.tər]	‘Jupiter’
(vi)	*hàbitat*	[ˈa.βi.tət]	‘habitat’
(vii)	*currícul+um*	[ku.ˈri.ku.lum]	‘curriculum’
(viii)	*làudan+um*	[ˈlaw.ðə.num]	‘laudanum’

Since our proposal is an attempt to conform the encliticisation stress systems to the unmarked stress patterns found in Catalan, here we will focus on these

unmarked patterns, and we will put the marked stress patterns on hold, unless they shed some crucial light on the data under study. It is important to note, in this regard, that the deviations found in the Catalan stress system are taken by Mascaró (1976) as an argument to consider that stress is specified underlyingly for each lexical item; it cannot be derived from the grammar, but has to be memorized instead. If our predictions are correct, and the encliticisation stress patterns indeed conform to the unmarked nominal stress system depicted above, this would constitute further evidence for a grammar-oriented approach to stress in Catalan.

Leaving this debate aside, previous work by Serra (1996) and Vallverdú (1997) framed within OT has argued that it is indeed possible to draw a regular mechanism of stress assignment in Catalan, governed by the grammar (that is, by a specific constraint hierarchy). The authors, following Cabré (1993) and Cabré & Kenstowicz (1995), claim that the unmarked foot in Catalan is trochaic (which derives from the ranking TROCHEE $\gg$ IAMB, and which represents that the head of the foot is initial and not final); that feet are constructed from right to left (a consequence of the activity of the constraint ALIGN(Foot, Right, PWd, Right)); that the integration of syllables into feet is not exhaustive in that there are no alternating stresses (by means of the mentioned alignment constraint outranking PARSE-σ, according to which all syllables must be parsed into feet); that feet must be minimally and maximally bimoraic (as a consequence of the high ranking of FOOT-BINARITY-μ); and that stress in Catalan is sensitive to weight (for which they resort to the crucial ranking of the constraint WEIGHT-TO-STRESS, according to which heavy syllables are metrically-prominent, and which yields final stress in consonant-final words like *enemic* 'enemy'—a behaviour which can also be taken as evidence for mora-defined feet). The study of stress in lexical categories other than nominal forms has received much less attention. For verbal forms, in which stress assignment is morphologized, see Oltra-Massuet (1999, 2000).

Our assumption for stress assignment in Catalan follows, *grosso modo*, these approaches. In what follows, we present the constraints involved, with their

definitions, grouped according to the constraint family they belong to (7-10). In (11) we present their ranking in Catalan as a Hasse diagram. (Disjunctive rankings, in which either constraint A or constraint B dominates constraint C, are not indicated.)

(7) Foot form constraints (adapted from McCarthy 2008)

(a) TROCHEE: Assign one violation mark for every foot whose head is not initial.

(b) IAMB: Assign one violation mark for every foot whose head is not final.

(8) Foot alignment constraints (adapted from McCarthy and Prince 1993b)

(a) ALL-FEET-RIGHT: Assign one violation mark for every syllable that intervenes between the right edge of every foot and the right edge of the Prosodic Word.

(b) ALL-FEET-LEFT: Assign one violation mark for every syllable that intervenes between the left edge of every foot and the left edge of the Prosodic Word.

(9) Foot size constraint (adapted from McCarthy and Prince 1986/1996, Prince 1983)

(a) FOOT-BINARITY-μ (minimally and maximally): Assign one violation mark for every foot that does not contain at least two moras and for every foot that has more than two moras.

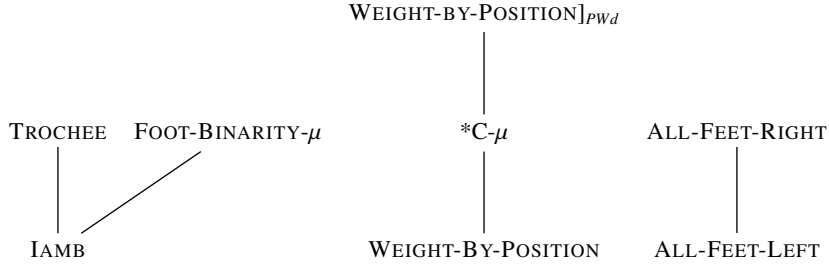
(10) Weight constraints

(a) *C-μ: Assign one violation mark for every mora that is exclusively associated with a coda consonant (adapted from Broselow *et al.* 1997).

(b) WEIGHT-BY-POSITION: Assign one violation mark for every coda consonant that does not project a mora (adapted from Prince 1990).

(c) WEIGHT-BY-POSITION]$_{PWd}$: Assign one violation mark for every coda consonant in word-final position that does not project a mora (adapted from Prince 1990).

(11) Constraint hierarchy (unmarked stress assignment in Catalan)



In tableau (12) we illustrate the evaluation of a two-syllable vowel-final noun, *ciri* 'altar candle', to show the ranking TROCHEE ≫ IAMB. Parsing only one syllable into a foot, as in candidate (12c), fatally violates FOOT-BINARITYμ. Candidate (12a) has initial stress, whereas candidate (12b) has final stress. The former is selected as the most harmonic candidate because it satisfies the top-ranked constraint TROCHEE at the expense of violating the dominated constraint IAMB. The two candidates perform equally well with respect to the two alignment constraints. Only candidate (12c) violates ALL-FEET-RIGHT; with two-syllable words it is impossible to know whether FOOT-BINARITYμ or ALL-FEET-RIGHT dominate IAMB, but see tableau (13). (Parentheses around exclamation marks indicate that there is a disjunctive constraint ranking, that is, that either one or the other constraint must dominate the lower constraint violated by the winning candidate. Parentheses around candidates indicate foot boundaries.)

(12) Tableau for *ciri* 'altar candle'

siɾi	Ft-Bin-μ	Trochee	All-Ft-R	Iamb	All-Ft-L
a. ☞ (ˈsi$_\mu$ɾi$_\mu$)				*	
b. (si$_\mu$ˈɾi$_\mu$)		*!			
c. (ˈsi$_\mu$)ɾi$_\mu$	*(!)		*(!)		

In tableau (13) we illustrate the evaluation of a three-syllable vowel-final noun, *canari* 'canary'. This type of forms are relevant for establishing the ranking All-Feet-Right ≫ All-Feet-Left. Parsing only one syllable into a foot, as in candidate (13e), fatally violates Foot-Binarityμ; this constraint dominates Iamb. Candidate (13d) has a left-aligned iambic foot. Although this metrification produces penultimate stress in three-syllable words, this candidate is ruled out because it violates both Trochee and All-Feet-Right. Candidate (13c), although it aligns the foot with the right word edge, still violates Trochee. Candidates (13a) and (13b) both satisfy Trochee. However, only candidate (13a) satisfies All-Feet-Right. This tableau, therefore, illustrates two ranking arguments: Trochee ≫ Iamb and All-Feet-Right ≫ All-Feet-Left. These two dominated constraints are violated by the winning candidate (13a).

(13) Tableau for *canari* 'canary'

kənaɾi	Ft-Bin-μ	Trochee	All-Ft-R	Iamb	All-Ft-L
a. ☞ kə(ˈna$_\mu$ɾi$_\mu$)				*	*
b. (ˈka$_\mu$nə$_\mu$)ɾi$_\mu$			*!	*	
c. kə$_\mu$(nə$_\mu$ˈɾi$_\mu$)		*!			*
d. (kə$_\mu$ˈna$_\mu$)ɾi$_\mu$		*(!)	*(!)		
e. kə$_\mu$nə$_\mu$(ˈɾi$_\mu$)	*!				**

The tableau in (14) shows the evaluation of a vowel-final noun in which the penultimate syllable is closed. The ranking of *C-μ above Weight-by-Position is characteristic of languages in which coda consonants do not contribute to syllable weight. This ranking implies that a coda consonant does not project a mora, as shown in candidate (14a), the optimal candidate. Both candidates (14b) and (14c) include a weight-contributing coda consonant. Besides their violation of *C-μ, candidate (14b) also incurs a violation of All-Feet-Right, because the last syllable of the word is not parsed into the foot, and candidate (14c) also violates Foot-Binarity-μ because the foot includes more than two moras. The winning candidate aligns the foot perfectly with the right word edge and satisfies Foot-Binarity-μ. No direct ranking arguments can be deduced from this evaluation; it can only be inferred that Weight-by-Position is dominated by either Foot-Binarity-μ or *C-μ, and by either All-Feet-Right or *C-μ. The reason why the ranking *C-$\mu \gg$ Weight-by-Position is necessary for Catalan will become clear when analysing words with stress on the third-to-last syllable and in which the penultimate syllable is closed (tableau 16). At this point, we assume that aligning the foot with the right word edge and restricting moras to only dominate vowels

(the segments with the highest level of sonority) takes priority over WEIGHT-BY-POSITION.

(14) Tableau for *indi* 'Indian'

indi	FT-BIN-μ	ALL-FT-R	*C-μ	WBP
a. ☞ ('i$_\mu$n.di$_\mu$)				*
b. ('i$_\mu$n$_\mu$)di$_\mu$		*(!)	*(!)	
c. ('i$_\mu$n$_\mu$di$_\mu$)	*(!)		*(!)	

In words ending in a consonant, however, stress is not penultimate, but final. We interpret this pattern as the result of positional markedness. Only word-final coda consonants contribute to syllable weight. The ranking of the positional markedness constraint WEIGHT-BY-POSITION]$_{PWd}$ (relativized to the right edge of the Prosodic Word) above *C-μ, which militates against moraic coda consonants, explains this pattern. The effect of WEIGHT-BY-POSITION]$_{PWd}$ is illustrated in the tableau in (15).

(15) Tableau for *nacional* 'national'

nəsion+al	WBP]$_{PWd}$	*C-μ	WBP
a. ☞ nə$_\mu$sju$_\mu$('na$_\mu$l$_\mu$)		*	
b. nə$_\mu$('sjo$_\mu$nə$_\mu$l)	*!		*

The reason why we claim that only word-final coda consonants are weight-contributing lies in the stress pattern found in loanwords with antepenultimate

stress in which the penultimate syllable is closed, as in *Manchester* or *Washington*. We suggest that antepenultimate stress is driven by the satisfaction of a lexically indexed version of the constraint NON-FINALITY(foot)$_I$ (based on McCarthy 2008), which penalizes parsing word-final syllables into feet (see Pater 2000 for lexically indexed constraints). Let us consider the tableau in (16). Both candidates (16d) and (16c) violate the top-ranked lexically indexed constraint NON-FINALITY(foot)$_I$ because the last syllable is integrated into a foot. Only candidate (16b) incurs more violations of *C-μ because the word-internal coda consonant is also moraic. It is precisely the ranking *C-μ $\gg$ WEIGHT-BY-POSITION that derives antepenultimate stress in these exceptional cases. If the opposite ranking would have been postulated, that is, WEIGHT-BY-POSITION $\gg$ *C-μ, no constraint could stop assigning penultimate stress in such forms. Candidate (16a) parses the first two syllables of the word into a foot because these two syllables are light, although closed. If all coda consonants were moraic in Catalan, NON-FINALITY(foot)$_I$ would be insufficient for deriving antepenultimate stress. This is the rationale behind the proposed ranking WEIGHT-BY-POSITION]$_{PWd}$ $\gg$ *C-μ $\gg$ WEIGHT-BY-POSITION.

(16) Tableau for *Manchester*

/mantʃester$_I$/	NON-FIN$_I$	ALL-FT-R	WBP]$_{PWd}$	*C-μ	WBP
a. ☞ (ˈma$_\mu$n.tʃə$_\mu$s)<tə$_\mu$r$_\mu$>		*		*	**
b. mə$_\mu$n$_\mu$(ˈtʃe$_\mu$s$_\mu$)<tə$_\mu$r$_\mu$>		*		**!*	
c. mə$_\mu$n.tʃə$_\mu$s(ˈte$_\mu$r$_\mu$)	*!			*	**
d. mə$_\mu$n(ˈtʃe$_\mu$s.tə$_\mu$r)	*!		*		***

As said in (6a), another exceptional stress pattern is found in words that end in a consonant and have penultimate stress, such as *capítol* ‘chapter’, *llapis* ‘pencil’,

or *numèric* 'numerical'. For the first two cases, which are monomorphemic, making use of an indexed version of the constraint *C/μ_I (to which these words are associated), ranked above WEIGHT-BY-POSITION]$_{PWd}$, is enough to prevent them from having a final heavy syllable. A syllabic trochee is thus built, and penultimate stress is derived. A form like *numèric* contains a pre-stressing suffix *-ic*, which forces the stress to fall on the previous syllable. For these cases, it is the suffix that carries the lexical index, and which explains the exceptional pattern. For vowel-final nouns with final stress, see §3.3.2.

Once the general analysis of stress in Catalan nominal elements has been presented, in the next subsection we can focus on the analysis of enclitic-induced stress shift.

3.2. Analysis of stress patterns under encliticisation

As we argue in depth in §4, the stress patterns found in Catalan cannot be accounted for in a unified way if they are exclusively attributed to different strategies regarding the incorporation of clitic elements into the prosodic hierarchy, as pursued in Selkirk (1995) and later in Peperkamp (1997) for Italian dialects; neither they can be explained because of their specific morphosyntactic structure, as proposed in Ordóñez & Repetti (2006, 2014) for various Romance varieties. In this paper we show that in fact the stress patterns in Catalan verb-enclitic groupings follow from the interaction of the constraint hierarchy that governs nominal stress in this language (see §3.1) with an anti-alignment constraint that expresses the tendency for certain morphosyntactically defined elements, in our case pronominal clitics, to lie outside the metrical structure (as proposed in Buckley 1998, among others). Before developing our proposal (§3.2.3), we introduce a full justification of the anti-alignment constraint on which our analysis pivots (§3.2.2).

3.2.1. The anti-alignment constraint *ALIGN-*Right(Foot, Clitic)*

In our analysis we make use of an anti-alignment constraint that prohibits the presence of feet whose right edge coincides with the right edge of a clitic, *ALIGN-Right(Foot, Clitic) (17).

(17) *ALIGN-Right(Foot, Clitic) (based on Buckley 1998)
Assign one violation mark for any foot that right-aligns with a clitic.

Unlike standard alignment constraints (McCarthy & Prince 1993), which demand the alignment of two categories in a defined edge, anti-alignment constraints (such as *ALIGN-Right(Foot, Clitic)) prohibits the alignment of two categories, also in a defined edge. This kind of anti-alignment formulation was proposed first by Downing (1994) and Inkelas (1999), and applied by Buckley (1998) to stress in Manam. Let us consider very quickly Buckley's analysis. Stress in Manam is final if the last syllable of the word is heavy; otherwise, stress is penultimate, a behaviour that also applies to suffixed forms. However, there is a pre-defined set of suffixes that idiosyncratically entail final extrametricality, in the sense that if they occur word-finally and yield a heavy penultimate syllable, stress will be penultimate, and if the penultimate syllable is light, stress will retract to the antepenultimate syllable. This is why these suffixes are referred to as AP (antepenultimate) suffixes. This morphologically-driven type of final extrametricality is understood as the effect of an anti-alignment constraint (Buckley 1998) (18).

(18) *ALIGN-Right(AP suffix, Foot) (Buckley 1998)
Assign one violation mark for any foot which right-aligns with an AP suffix.

We argue that the stress patterns found in Catalan encliticisation are driven by a version of these anti-alignment constraints, namely *ALIGN-Right(Foot, Clitic). The benefits of invoking a constraint such as this one, with respect to alternative analyses (see §4), is that it is capable of deriving not only the unstressed and non-shifting character of pronominal enclitics in Barcelona Catalan, but also their

stressability in Mallorca and Menorca Catalan. As we will see, in some cases satisfying this constraint will entail having the clitic or the combination of clitics unfooted (i.e. Barcelona Catalan). In some other cases, the very same constraint will imply not having phonological material with diverse morphological affiliation parsed within the same foot, as in Barcelona Catalan, and also as in Mallorca and Menorca Catalan, in this latter case without the need to leave the clitic(s) unparsed, as we will see in detail.[6] Of course, the satisfaction of the anti-alignment constraint (Barcelona, Mallorca and Menorca Catalan vs. Formentera Catalan) or the way it is satisfied (Barcelona Catalan vs. Mallorca and Menorca Catalan) will depend on its crucial interaction with other constraints: as we will see, the constraint responsible for right-alignment of feet, ALL-FEET-RIGHT, and also *EMPTY-μ, whose violation will entail catalexis, the addition of a melodically empty prosodic unit, which we will identify as a mora in our analysis of Mallorca and Menorca Catalan.

3.2.2. Analysis of the stress patterns in Formentera Catalan encliticisation

In Formentera Catalan, the stress pattern of verb-enclitic groupings directly matches the unmarked nominal stress system of Catalan depicted in §2.1. (see Torres-Tamarit 2008 and Bonet & Torres-Tamarit 2010, 2011). Recall that an isolated imperative form like *compra* has penultimate stress (['kɔmprə]). This is why the attachment of a vowel-final enclitic triggers stress shift to the penultimate syllable and why the attachment of a consonant-final enclitic triggers stress shift to the final syllable of the whole sequence. A perfectly right-aligned moraic trochee is thus built considering the whole verb-enclitic grouping.[7] In this variety, in which the achievement of a right-aligned moraic trochee has priority, feet need to be right-aligned with the whole verb-clitic sequence, and this is a consequence of the ranking ALL-FEET-RIGHT ≫ *ALIGN-Right(Foot, Clitic). Therefore, clitics can either form a foot with the preceding

[6] Recall that in Mallorca and Menorca Catalan clitics are stressed, which means that they are necessarily footed and moreover occupy the head position of the foot.

[7] The plural suffix /z/ never contributes to syllable weight.

verbal material ([kum(ˈprə.lə)], [kum(ˈprəl)]), or be footed alone, if more than one clitic is attached ([kum.prə(ˈmə.lə)]). Both situations are illustrated in the tableaux (20-21). For expository reasons, in the following tableaux no candidates violating TROCHEE are considered. Note, on the other hand, that all enclitics are considered to be internal to the prosodic word, a configuration that follows from the undominated character of EXHAUSTIVITY, according to which no syllable can be parsed directly by a phonological phrase.

Tableau (19) illustrates the evaluation of a 2SG imperative form followed by a 3ACC.F.SG enclitic, which ends in a vowel. In these cases we expect to find stress shift one syllable to the right, which coincides with the last syllable of the imperative form. The vowel-final enclitic is parsed as the foot's dependent, and a perfectly right-aligned moraic trochee is built in order to satisfy undominated ALL-FEET-RIGHT, which dominates the anti-alignment constraint *ALIGN-Right(Foot, Clitic).[8]

(19) Tableau for *compra-la* 'buy-2SG.IMP it-3SG.F.ACC'

kompr+ə#lə	ALL-FT-R	FT-BIN-μ	WBP]$_{PWd}$	*AL-R(Ft,Cl)	*C-μ
a. ☞ ku$_\mu$m(ˈprə$_\mu$lə$_\mu$)				*	
b. (ˈko$_\mu$m.prə$_\mu$)lə$_\mu$	*!				

Tableau (20) illustrates the evaluation of a 2SG imperative form followed by a 3ACC.M.SG enclitic, which has no vowel; this means that the verb plus enclitic sequence ends in a consonant. In such cases, stress shifts to the last syllable of the

[8] Some of the schwas that appear after clitics (*comprar-ne, comprar-me*) have traditionally been interpreted as epenthetic, and this could be a problem for our proposal since the constraint *ALIGN-Right(Foot, Clitic) would not be violated in metrifications like *com(prar-ne)* or *com(prar-me)*. However, the epenthetic status of these schwas is not without controversy (see Oltra-Massuet 1999, Artés 2016) and they are better interpreted as theme vowels, which therefore belong to the clitic.

imperative form. The enclitic, which contributes a mora because it is syllabified as a word-final coda, is also parsed into the foot, and ALL-FEET-RIGHT is again satisfied at the expense of violating *ALIGN-Right(Foot, Clitic). This tableau also demonstrates that WEIGHT-BY-POSITION]$_{PWd}$ dominates *C-μ.

(20) Tableau for *compra'l* 'buy-2SG.IMP it-3SG.M.ACC'

kompɾ+ə#l	ALL-FT-R	FT-BIN-μ	WBP]$_{PWd}$	*AL-R(Ft,Cl)	*C-μ
a. ☞ ku$_\mu$m(ˈpɾə$_\mu$l$_\mu$)				*	*
b. (ˈko$_\mu$m.pɾə$_\mu$l)			*!	*	
c. (ˈko$_\mu$m)pɾə$_\mu$l$_\mu$	*(!)	*(!)			*

As shown in tableau (21), when two enclitics are adjoined to an imperative form, the clitic sequence provides enough segmental material to absorb a whole right-aligned moraic trochee.

(21) Tableau for *compra-me-la* 'buy-2SG.IMP it-3SG.F.ACC to me'

kompɾ+ə#mə#lə	ALL-FT-R	FT-BIN-μ	WBP]$_{PWd}$	*AL-R(Ft,Cl)	*C-μ
a. ☞ ku$_\mu$m.pɾə$_\mu$(ˈmə$_\mu$lə$_\mu$)				*	
b. ku$_\mu$m(ˈpɾə$_\mu$mə$_\mu$)lə$_\mu$	*!			*	
c. (ˈko$_\mu$m.pɾə$_\mu$)mə$_\mu$lə$_\mu$	*!*				

The following tableaux illustrate why there is no stress shift in sequences of infinitive forms followed by one enclitic. Isolated infinitive forms have final stress (/kompɾ+a+ɾ/ → [kum.ˈpɾa]). A perfectly right-aligned moraic trochee can be constructed thus when a clitic containing a vowel is attached without the need

of stress shift (22). When two enclitics are attached, as in tableau (23), however, stress shift occurs, as in imperative forms, because shifting the stress is the only way to obtain a right-aligned moraic trochee.

(22) Tableau for *comprar-li* 'to buy-INF. to him'

kompr+a+r#li	ALL-FT-R	FT-BIN-μ	WBP]$_{PWd}$	*AL-R(Ft,Cl)	*C-μ
a. ☞ ku$_\mu$m(ˈpra$_\mu$l.li$_\mu$)				*	
b. ku$_\mu$m(ˈpra$_\mu$l)li$_\mu$	*(!)	*(!)			
c. (ˈko$_\mu$m.prə$_\mu$l)li$_\mu$	*!				

(23) Tableau for *comprar-me-la* 'to buy-INF it-3SG.F.ACC to me'

kompr+a+r#mə#lə	ALL-FT-R	FT-BIN-μ	WBP]$_{PWd}$	*AL-R(Ft,Cl)	*C-μ
a. ☞ ku$_\mu$m.prə$_\mu$r(ˈmə$_\mu$lə$_\mu$)				*	
b. ku$_\mu$m(ˈpra$_\mu$r.mə$_\mu$)lə$_\mu$	*!			*	
c. ku$_\mu$m(ˈpra$_\mu$r)mə$_\mu$lə$_\mu$	*(!)*	*(!)			
d. (ˈko$_\mu$m.prə$_\mu$r)mə$_\mu$lə$_\mu$	*!*				

3.2.3. Analysis of the stress patterns in Barcelona Catalan encliticisation

In Barcelona Catalan, pronominal enclitics never trigger stress shift. This follows from the need to satisfy *ALIGN-Right(Foot, Clitic), which has priority over reaching an unmarked metrical structure, that is, the right-aligned moraic trochee. The satisfaction of *ALIGN-Right(Foot, Clitic) always implies that all clitics remain unfooted, but still parsed into the prosodic word (we assume that

EXHAUSTIVITY is undominated for all Catalan dialects under consideration). In tableau (24), satisfying the top-ranked anti-alignment constraint implies the selection of candidate (24a), with the clitic unparsed, as the most harmonic. In tableau (25), the clitic has no vowel, and it necessarily has to be parsed as a coda consonant. As a consequence of this, if the right edge of the clitic cannot coincide with the right edge of the foot as demanded by *ALIGN-Right(Foot, Clitic), the last syllable of the sequence containing the clitic must be left unparsed. This results in selecting candidate (25a), which contains a degenerate, monomoraic foot; the anti-alignment constraint *ALIGN-Right (Clitic, Foot) thus dominates FOOT-BINARITY-μ. In sequences containing two enclitics that correspond to two syllables, as in (26), the foot ends up being located two syllables away from the right word edge.

(24) Tableau for *compra-la* 'buy-2SG.IMP it-3SG.F.ACC'

kompr+ə#lə	*AL-R(Ft,Cl)	WBP]$_{PWd}$	ALL-FT-R	FT-BIN-μ	*C-μ
a. ☞ ('ko$_\mu$m.pɾə$_\mu$)lə$_\mu$			*		
b. ku$_\mu$m('pɾɛ$_\mu$lə$_\mu$)	*!				

(25) Tableau for *compra'l* 'buy-2SG.IMP it-3SG.M.ACC'

kompr+ə#l	*AL-R(Ft,Cl)	WBP]$_{PWd}$	ALL-FT-R	FT-BIN-μ	*C-μ
a. ☞ ('ko$_\mu$m)pɾə$_\mu$l$_\mu$			*	*	*
b. ('ko$_\mu$m.pɾə$_\mu$l)	*(!)	*(!)			
c. ku$_\mu$m('pɾɛ$_\mu$l$_\mu$)	*!				*

(26) Tableau for *compra-me-la* ‘buy-2SG.IMP it-3SG.F.ACC to me’

kompɾ+ə#mə#lə	*AL-R(Ft,Cl)	WBP]$_{PWd}$	ALL-FT-R	FT-BIN-μ	*C-μ
a. ☞ (ˈko$_\mu$m.pɾə$_\mu$)mə$_\mu$lə$_\mu$			**		
b. ku$_\mu$m(ˈpɾɛ$_\mu$mə$_\mu$)lə$_\mu$	*!		*		
c. ku$_\mu$m.pɾə$_\mu$(ˈmɛ$_\mu$lə$_\mu$)	*!				

With infinitive forms, stress always falls on the last syllable of the verbal base, that is, on the thematic vowel preceding the infinitive morph /ɾ/. In order to rule out candidate (c) in tableau (27) ([(ˈko$_\mu$m.pɾə$_\mu$r)li$_\mu$]), with initial stress, one must assume that the thematic vowel is underlyingly stressed.[9] A faithfulness constraint IDENT(stress) is therefore satisfied in encliticised infinitives in Barcelona Catalan. The constraint IDENT(stress) dominates FOOT-BINARITY-μ because it enforces the creation of a degenerate, monomoraic foot.[10]

(27) Tableau for *comprar-li* ‘to buy-INF. to him’

[9] As a reviewer points out, this behaviour, along with the fact that stress falls on the rightmost vowel of the root in all verbal forms with unstressed endings (e.g. *carrèg-o* ‘I carry’, *carrèg-ues* ‘you carry’, *carrèg-ues* ‘(s)he carries’ cf. *cárreg-a* ‘load’; *fabríc-o* ‘I fabricate’, *fabríq-ues* ‘you fabricate’, *fabríc-a* ‘(s)he fabricates’ cf. *fàbric-a* ‘factory’), must be taken as strong evidence that the Catalan verbal stress system is morphologically driven (as advocated for in Mascaró 1985).

[10] The use of the constraint IDENT(stress) implies that we assume that metrical structure can be present underlyingly. The IPA symbol for stress in tableaux’ inputs means that the thematic vowel is parsed into a syllable that is a foot’s head. In the mapping from the input to the output form, all other structure-building prosodic operations are performed: syllabification, adjoining a foot’s dependent, etc. Another possible analysis is that stress on the thematic vowel is not an underlying property but the result of satisfying a constraint such as *UNSTRESSED-THEMATIC-VOWEL (see Oltra-Massuet 1999, and Oltra-Massuet and Arregi 2005 for the metrical role of thematic vowels in Catalan verbs).

kompɾ+ˈa+ɾ#li	Id(str)	*Al-R(Ft,Cl)	WdP]$_{PWd}$	All-Ft-R	Ft-Bin-μ	*C-μ
a. ☞ ku$_\mu$m(ˈpɾa$_\mu$r)li$_\mu$				*	*	
b. ku$_\mu$m(ˈpɾa$_\mu$r.li$_\mu$)		*!				
c. (ˈko$_\mu$m.pɾə$_\mu$r)li$_\mu$	*!			*		

It should be shown that underlying stress on the theme vowel does in fact derive the correct surface forms for all Catalan verb forms. We follow the morphological analysis of verbal forms in Mascaró (1985). If we consider verbs of the first conjugation type, like *comprar* 'to buy', assuming an underlyingly stressed thematic vowel does in fact derive the infinitive form: /kompɾ-ˈa-ɾ/ → [kum.ˈpɾa], where /-ɾ/ is the infinitive morph. In the indicative mode, the thematic vowel also surfaces as stressed in the imperfect: /kompɾ-ˈa-bə-m/ → [kum.ˈpɾa.βəm] 'we used to buy', where /-bə-/ is the tense/mode morph, imperfect, and /-m/ corresponds to person/number features, first person plural. In the future and in the conditional, however, the thematic vowel surfaces as an unstressed schwa. This is not a problem since the tense/mode morph of the future and the conditional surfaces as stressed, meaning that they must also be underlyingly stressed: /kompɾ-ˈa-ˈɾɛ-m/ → [kum.pɾə.ˈrɛm] 'we will buy'; /kompɾ-ˈa-ˈɾiə-m/ → [kum.pɾə.ˈri.əm] 'we would buy'. As it happens in derivation, the rightmost underlyingly stressed morpheme is the one that surfaces as such: /nəsion-ˈal/ → [nə.sju.ˈnal] 'national'; /nəsion-ˈal-ˈidʒ-u/ → [nə.sju.nə.ˈli.dʒu] 'I nationalise'; /nəsion-ˈal-ˈidʒ-ˈa-ɾ/ → [nə.sju.nə.li.ˈdʒa] 'to nationalise'. The thematic vowel also appears as stressed in first and second person plural forms in the present indicative and subjunctive, which are homophonous: /kompɾ-ˈɛ--m/ → [kum.ˈpɾɛm] 'we buy(-subj)'. In these forms, the thematic vowel of first conjugation type verbs is instead /ɛ/. In the past subjunctive, the thematic vowel also surfaces as stressed, which implies that the tense/mood morph that follows is underlyingly unstressed: /kompɾ-ˈe-si-m/ → [kum.ˈpɾe.sim] 'we bought(-subj)'.

In these forms, the thematic vowel is instead /ˈe/. Comparing [kum.ˈpɾe.sim] 'we bought(-SUBJ)' with [kum.pɾə.ˈri.əm] 'we would buy', for instance, shows that stress assignment in Catalan verbal forms is morphologized and needs to be a lexical property of some morphs. In Balearic Catalan, the thematic vowel in first and second person plural forms in the present indicative and in all forms of the past subjunctive is /ˈa/: [kum.ˈpɾam], [kum.ˈpɾa.sim], a further evidence that both /ˈɛ/ and /ˈe/ are also thematic vowels in Barcelona Catalan (see Mascaró 1985 for more details). The alternation of vowel quality can be attributed to paradigmatic pressures originated in second conjugation verbs.

In sequences of an infinitive followed by more than one enclitic, stress is also stable compared with the non-encliticised forms. In tableau (28) the evaluation of an infinitive followed by two enclitics that correspond to two syllables is shown. Candidates (28b,c) are ruled out because they fatally violate the anti-alignment constraint. Candidate (28d) is better than candidate (28a) because a bimoraic trochee is built, but only (28a) stresses the thematic vowel as demanded by IDENT(stress).

(28) Tableau for *comprar-me-la* 'to buy-INF it-3SG.F.ACC to me'

kompɾ+ˈa+ɾ#mə#lə	ID(str)	*AL-R(Ft,Cl)	WBP]$_{PWd}$	ALL-FT-R	FT-BIN-μ	*C-μ
a. ☞ ku$_\mu$m(ˈpɾa$_\mu$r)mə$_\mu$lə$_\mu$				**	*	
b. ku$_\mu$m(ˈpɾa$_\mu$r.mə$_\mu$)lə$_\mu$		*!		*		
c. ku$_\mu$m.pɾə$_\mu$r(ˈmɛ$_\mu$lə$_\mu$)	*(!)	*(!)				
d. (ˈko$_\mu$m.pɾə$_\mu$r)mə$_\mu$lə$_\mu$	*!			**		

3.2.4. Analysis of the stress patterns in Mallorca and Menorca Catalan encliticisation

So far, the two crucial constraints that we have put forward to account for the differences between Formentera and Barcelona Catalan, *ALIGN-Right(Foot,

Clitic) and ALL-FEET-RIGHT, were in conflict; when one of the two constraints was satisfied, the other was violated. It is legitimate, though, to explore whether the selection of a candidate that satisfies both constraints is possible. In other words, can GEN generate candidates in which the right edge of a foot does not coincide with the right edge of a clitic but, at the same time, have this foot perfectly aligned with the right word edge? Our answer to this question is affirmative and we claim that this situation is attained if catalexis is considered.

Catalexis is a concept borrowed from metrics and, since Kiparsky (1991), it has been understood as the operation of inserting a prosodic constituent that is melodically empty and the logical counterpart of extrametricality. Whereas extrametrical constituents are melodically full but invisible to prosodic rules and principles, catalectic elements are melodically empty but accessible to prosodic rules (Kager 1995). Although the original theoretical justifications for catalexis were the elimination of degenerate feet and the satisfaction of word-minimality, in our case there is a different reason: the need to avoid a clitic right-aligned with the foot, but at the same time satisfying the alignment constraint demanding feet to align with the right edge of the word (for a catalectic account of marked stress in Spanish, see Meinschaefer forthcoming, which has inspired part of our proposal).

At a more precise level, we claim that a catalectic mora—Catalan is a weight sensitive language—is inserted to the right word edge in encliticised forms so that both *ALIGN-Right(Foot, Clitic) and ALL-FEET-RIGHT are satisfied. This catalectic mora indeed intervenes between the right edge of the clitic and that of the foot, and, at the same time, allows the foot to be placed at the right word edge. This explains why stress is consistently shifted to the last syllable of the whole verb-enclitic grouping in Mallorca and Menorca Catalan. Of course, though, the insertion of this prosodic element and its parsing with the preceding syllable in the foot also entails the satisfaction of FOOT-BINARITY-μ.

The prosodic representation in (30) shows an encliticised imperative with final stress ($[\mathrm{do.nə}(\mathrm{'li}_{\mu}{}^{\mu})]$ ‘give-2SG.IMP to him/her’). The superscript mora indicates it

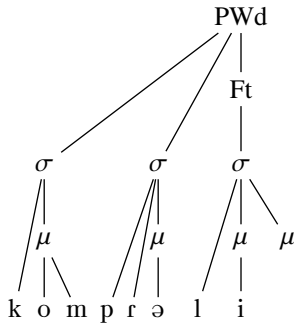
is catalectic, that is, melodically empty. This representation shows that a right-aligned bimoraic foot can be built at the right word edge and still misalign the foot with the right edge of the clitic. The insertion of the catalectic mora introduces a violation of the faithfulness constraint *EMPTY-μ, defined in (29).

(29) *EMPTY-μ

Assign one violation mark for every melodically empty mora.

A candidate in which the inserted mora is linked to the vowel belonging to the clitic would be ruled out by the constraint against bimoraic long vowels *Vː, which is undominated in Catalan, a language that bans long vowels completely. It should be noted that the catalectic mora in (30) counts as metrical structure because it is part of the syllable and the foot, although it dominates no melodic element.

(30) Catalexis in Mallorca and Menorca Catalan



The tableau in (31) shows that the optimal candidate in Mallorca and Menorca Catalan is the one with a catalectic mora and final stress. This candidate satisfies both *ALIGN-Right(Foot, Clitic) and ALL-FEET-RIGHT at the expense of violating *EMPTY-μ, which is dominated.

(31) Tableau for *compra-la* ‘buy-2SG.IMP it-3SG.F.ACC’

kompr+ə#lə	*AL-R(Ft,Cl)	ALL-FT-R	*EMPTY-μ
a. ☞ ko$_\mu$m.pr ə$_\mu$('lə$_\mu^\mu$)			*
b. ('ko$_\mu$m.pr ə$_\mu$)lə$_\mu$		*!	
c. ko$_\mu$m('pr ə$_\mu$lə$_\mu$)	*!		

The fact that the right edge of the clitic cannot coincide with the right edge of the foot forces clitics parsed as coda consonants not to project a mora, that is, a violation of WEIGHT-BY-POSITION]$_{PWd}$. By comparing candidate (32c), in which the clitic right-aligns with the foot, with candidate (32a), the winner, we see that *ALIGN-Right(Foot, Clitic) dominates WEIGHT-BY-POSITION]$_{PWd}$.[11]

(32) Tableau for *compra'l* 'buy-2SG.IMP it-3SG.M.ACC'

kompr+ə#l	*AL-R(Ft,Cl)	ALL-FT-R	FT-BIN-μ	*EMPTY-μ	WBP]$_{PWd}$	*C-μ
a. ☞ ko$_\mu$m('pr ə$_\mu$l$^\mu$)				*	*	
b. ('ko$_\mu$m)pr ə$_\mu$l$_\mu$		*(!)	*(!)			*
c. ko$_\mu$m('pr ə$_\mu$l$_\mu$)	*!					*
d. ('ko$_\mu$m.pr ə$_\mu$l)	*!				*	

There are no more ranking arguments in Mallorca and Menorca Catalan, so the

[11] There is also an alternative constraint hierarchy for Mallorca and Menorca Catalan in which there is no catalexis only for those cases ending in a consonant, as in [ko$_\mu$m('pr ə$_\mu$l$_\mu$)], everything else being equal. Such an output form is identical phonetically; that is, it has final stress. The ranking for such a grammar is the following: ALL-FEET-RIGHT, FOOT-BINARITY-μ, WEIGHT-BY-POSITION]$_{PWd}$ ≫ *ALIGN-Right(Foot, Clitic), *C-μ ≫ *EMPTY-μ, IDENT(stress). This grammar has been checked with OT-Help 2.0 (Staubs et al. 2010).

above tableaux are enough to illustrate the system. In sum, for all encliticised forms, the candidate with final stress and a catalectic mora is selected as the optimal one because both *Align-Right(Foot, Clitic) and All-Feet-Right must be satisfied. This is achieved at the expense of inserting a melodically empty mora that has no correspondent in the input. The need for catalexis also renders final codas non-moraic. If they were moraic, feet would end up being trimoraic, which would cause a violation of Foot-Binarity-μ.

3.3. Interim remarks

In this section we present the crucial aspects of the analysis of the stress patterns in each dialect (§3.3.1). We also give some additional evidence for catalexis in Mallorca and Menorca Catalan (§3.3.2) and look closer at exceptional penultimate stress in Menorca Catalan verb-enclitic groupings (§3.3.3).

3.3.1. Main constraint-ranking differences between the three varieties

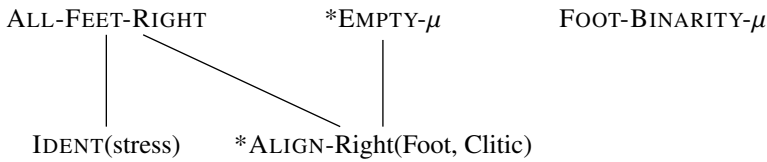
In the previous sections, we have shown that the encliticisation stress patterns conform to the unmarked stress system for nominals in Catalan. This fact should not be surprising as long as enclitics are in fact pronouns.

Let us revise now the main differences between the three varieties. We have seen that one enclitic in Formentera Catalan triggers stress shift in imperative forms, and a sequence of two enclitics triggers stress shift in both imperative and infinitive forms (2pl imperative forms in isolation also have final stress, and therefore they pattern with infinitive forms). Stress is final when the whole verb-enclitic grouping ends in a consonant, and penultimate if the whole sequence ends in a vowel. This pattern found in verb-enclitic groupings gives additional support to the argument that the unmarked foot in (Formentera) Catalan is the moraic trochee, and that clitics are prosodically internal, that is, are always parsed into a foot, which necessarily entails that clitics are internal to the prosodic word. This pattern is achieved through satisfaction of All-Feet-Right at the expense of violating *Align-Right(Foot, Clitic), the anti-alignment constraint

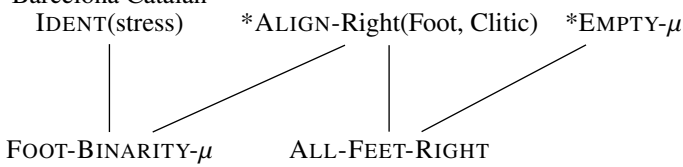
against aligning the right edge of clitics and the foot. In Barcelona Catalan, the absence of stress shift is the result of satisfying the anti-alignment constraint *ALIGN-Right(Foot, Clitic), which takes priority over building a right-aligned moraic trochee. Finally, in Mallorca and Menorca Catalan, the last enclitic in a sequence of two enclitics is stressed, as it is the only one in one-enclitic sequences. This is the result of satisfying both *ALIGN-Right(Foot, Clitic) and ALL-FEET-RIGHT thanks to the insertion of a catalectic, melodically empty mora.

(33) Hasse diagrams

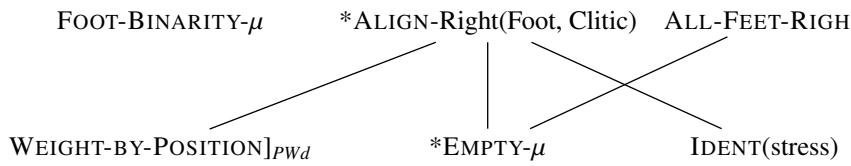
(a) Formentera Catalan



(b) Barcelona Catalan



(c) Mallorca and Menorca Catalan



In (34) we present the factorial typology that derives from the ranking of the three crucial constraints involved in pronominal enclitic-induced stress shift in Catalan. These three constraints are enough to derive the microvariation found in Catalan dialects with respect to the stress patterns found in verb-enclitic groupings.

(34) Factorial typology for the set of relevant constraints

Formentera	*EMPTY-μ, ALL-FT-R ≫ *AL-R(Ft,Cl)
Barcelona	*EMPTY-μ, *AL-R(Ft,Cl) ≫ ALL-FT-R
Mallorca & Menorca	*AL-R(Ft,Cl), ALL-FT-R ≫ *EMPTY-μ

3.3.2. Independent evidence for catalexis in Catalan

Catalexis is put forward by Kiparsky (1991) and Kager (1995) to explain a robust cross-linguistic correlation between the occurrence of peripheral stresses at the end of metrical parsing, which need to be analysed as stemming from degenerate feet, and the occurrence of subminimal words in the same language. These authors claim that if a language allows for peripheral stresses, then subminimal words will also be possible. If degenerate feet are not allowed, therefore subminimal words should not exist, meaning that catalexis is not possible in such language.

Some independent evidence suggests that catalexis is available in the Balearic varieties spoken in Mallorca and Menorca. In these varieties, there is a higher frequency of "minimal words" (i.e. with the surface structure CV) than in other Catalan dialects due to a widespread process of word-final posttonic /ɾ/ deletion. Some examples, which are circumscribed to Mallorca and Menorca Catalan,

appear in (35).

(35) Subminimal words in Mallorca and Menorca Catalan

mar	[ˈma]	'sea'	cf.	*maregassa*	[məɾəˈɣasə]	'rough see'
cor	[ˈkɔ]	'heart'	cf.	*coret*	[koˈɾət]	'heart.DIM'
car	[ˈka]	'expensive'	cf.	*caríssim*	[kəˈɾisim]	'very expensive'

Catalan in general, though, is a fair contender for a catalectic approach, at least as a potential strategy, since it is possible to find subminimal words either without any underlying word-final consonant (36a) or containing an underlying /n/ or /ɾ/, which delete in word-final posttonic position (36b) (see 9b). Catalan also permits polysyllabic oxytonic words ending in a vowel both in the native vocabulary (36c) and in loanwords (36d). (For expository reasons, the phonetic transcriptions in the following examples correspond to Central Catalan.)

(36) (a) Subminimal words

re	[ˈre]	'D (musical note)'
fe	[ˈfɛ]	'faith'
nu	[ˈnu]	'naked-M'

(b) Subminimal words with word-final underlying /n/ and /ɾ/

fi	[ˈfi]	'thin'	cf.	[ˈfins]	'thin-PL'
por	[ˈpɔ]	'fear'	cf.	[puˈɾuk]	'fearful'
clar	[ˈkla]	'clear'	cf.	[klə.ɾəˈðat]	'clarity'

(c) Vowel-final oxytonic native words

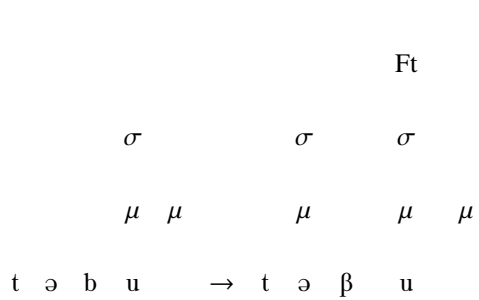
allà	[əˈʎa]	'there'
això	[əˈʃɔ]	'this'
ahir	[əˈi]	'yesterday'

(d) Vowel-final oxytonic loanwords

xampú	[ʃəmˈpu]	'champoo'
tabú	[təˈβu]	'tabu'
colibrí	[kuliˈβɾi]	'hummingbird'

In principle both subminimal words and oxytonic vowel-final words violate FOOT-BINARITY-μ. By resorting to catalexis, however, we can assume that all the above cases in fact conform to a bimoraic foot (see Kager 1999). We claim that it is precisely the fact that Catalan allows catalectic moras that subminimal words and vowel-final oxytonic forms exist in the language, following the argumentation in Kiparsky (1991) and Kager (1995). For the cases in which there is an underlying /n/ or /ɾ/ that deletes when it occurs in posttonic word-final position, it can be claimed that the catalectic mora has originated from that consonant (this is in fact a case of a cross-level opaque interaction in which word-final /n/ or /ɾ/ deletion counterbleeds final stress assignment).[12] For the other cases in which there is no trace of an underlying word-final consonant, one can assume that there is an underlying bimoraic final syllable in which the last mora is catalectic, melodically empty. Exceptional stress in these cases is solved by postulating underlying prosodic structure, in this case just a bimoraic final syllable with a second catalectic mora as in (37). The grammar is then responsible for building a right-aligned foot on top of that syllable.[13]

(37) Input-output mapping for exceptional final stress in vowel-final words



[12] We think that the easiest way to deal with such cases of opacity could be assuming Containment, in which all input structure is contained in the output. If the final underlying /n/ or /ɾ/ are not deleted in the output but just left unpronounced, it could be proposed that these consonants, being visible for metrical purposes, project their moras (see Serra 1996 for a similar approach). A Containment implementation of stress assignment would not affect the overall analysis of stress assignment in verb-clitic groupings.

[13] See the analysis of general stress assignment in nominal forms in §2.

In sum, we think that the advantages of catalexis against assuming degenerate feet are: (i) the catalectic mora is not only a strategy to comply with well-formed metrical structures, but when it is underlying it yields marked stress (i.e. oxytonic words that end in a vowel); and (ii) it correlates with the possibility of admitting apparently subminimal words (recall that the correlation between peripheral stress and subminimal words is the argument behind catalexis in Kager 1995).

3.3.3. Stress paradigm uniformity in Menorca Catalan

As we have shown, in Menorca Catalan stress shifts to the last syllable of the encliticised sequence, as in Mallorca Catalan, except for certain forms with 3.F.ACC pronominal enclitics (see the data in §2 for more details).[14] It is interesting to note that the same pronominal enclitics can be stressed or not depending on whether the verbal form they attach to is an imperative or an infinitive. 3.F.ACC pronominal enclitics are the only ones that are inflected by gender and number, as opposed to 3.DAT pronominal enclitics, which are only inflected by number. We can therefore assume that encliticised forms involving 3.ACC pronominal enclitics enter into paradigmatic relations governed by inflection. If we compare the paradigm in (38) involving 2SG.IMP forms plus 3.ACC enclitics with the paradigm in (39), involving infinitive forms plus the same enclitics, we see that the location of stress is uniform within all the forms in the paradigm. If the stress in (38) were always final, as in Mallorca Catalan, it would be non-uniform across the paradigm because the masculine forms have no desinential ending and it would fall on the last vowel of the verbal stem except for forms with a feminine enclitic. The infinitive-enclitic groupings in (39), in contrast, end all in a vowel, which allows both final stress and stress uniformity within the paradigm (Grimalt 2002, 2004 also attributes these cases to paradigmatic pressures).

(38) Stress uniformity in imperative forms (final and penultimate stress)

[14] Recall that this behaviour is also found in some varieties of Mallorca Catalan.

[kum.ˈpɾəl] ‘buy-2SG.IMP it-3SG.M.ACC’

[kum.ˈpɾə.lə] ‘buy-2SG.IMP it-3SG.F.ACC’

[kum.ˈpɾəls] ‘buy-2SG.IMP it-3PL.M.ACC’

[kum.ˈpɾə.ləs] ‘buy-2SG.IMP it-3PL.F.ACC’

(39) Stress uniformity in infinitive forms (final stress)

[kum.pɾəl.ˈlo] ‘buy-INF it-3SG.M.ACC’

[kum.pɾəl.ˈlə] ‘buy-INF it-3SG.F.ACC’

[kum.pɾəl.ˈlos] ‘buy-INF it-3PL.M.ACC’

[kum.pɾəl.ˈləs] ‘buy-INF it-3PL.F.ACC’

In order to analyse paradigm uniformity effects, we make use of McCarthy’s (2005) Optimal Paradigms approach. Below we list the principles of Optimal Paradigm.

(40) Optimal Paradigms

(a) “Candidates consist of entire inflectional paradigms, where an inflectional paradigm contains all and only the words based on a single lexeme.”

(b) “The stem (output form of the shared lexeme) in each paradigm member is in correspondence relation $\Re_{OP}$ with the stem in every other paradigm member. [...] There is no distinctive base—rather, every member of a paradigm is a base of sorts with respect to every other member.”

(c) “There is a set of output-output faithfulness constraints on the $\Re_{OP}$ correspondence relation.”

Verb-enclitic groupings can be seen as complex stems (enclitics, which interact transparently with some word-level phonological processes, are equivalent to derivational affixes). In fact, more than one syntactic terminal, in this case the verb plus the enclitic(s), can be assigned a single morphological word terminal by the post-syntactic morphological component (as defended in Bermúdez-Otero and

Payne 2011), if it is assumed that morphology takes place after syntax. Therefore, it makes sense to postulate an Optimal Paradigms constraint OP_{V+Cl}-IDENT(stress), which guarantees stress uniformity among the members of a paradigm consisting of a verb plus accusative enclitics, which are the only enclitics that are inflected for both gender and number.

(41) OP_{V+Cl}-IDENT(stress)

The syllables standing in $\mathfrak{R}_{OP(V+Cl)}$ correspondence must be identical for stress.

The constraint OP_{V+Cl}-IDENT(stress), ranked above the anti-alignment constraint in Menorca Catalan, derives the data presented above, as illustrated in the following tableaux (only catalectic moras are now included). Candidate (b) in (44) violates eight times OP_{V+Cl}-IDENT(stress) because for each member of the candidate, there are two other candidates with a different stress pattern (4x2). Candidate (a), however, satisfies this constraint because stress is regular throughout the paradigm. The winning candidate, however, fairs worse with respect to the anti-alignment constraint because all four members of the candidate align the right edge of the clitic with the right edge of the foot.

(42) Tableau for *compra*-3P.ACC. 'buy-2SG.IMP-3.ACC'

/compr+a#3.ACC/		OP$_{V+Cl}$-IDENT(stress)	*AL-R(Ft,Cl)
a. ☞	co$_\mu$m('pra$_\mu$l$_\mu$) co$_\mu$m('pra$_\mu$la$_\mu$) co$_\mu$m('pra$_\mu$ls$_\mu$) co$_\mu$m('pra$_\mu$le$_\mu$s)		****
b.	co$_\mu$m('pra$_\mu$l$_\mu$) co$_\mu$m.pra$_\mu$('la$_\mu{}^\mu$) co$_\mu$m('pra$_\mu$l$_\mu$s) co$_\mu$m.pra$_\mu$('le$_\mu$s$^\mu$)	*!*******	**

When accusative enclitics all end in a vowel (after infinitives, and also after second plural imperative forms), both candidates satisfy the Optimal Paradigms constraint. It is then *ALIGN-Right(Foot, Clitic) the responsible constraint for choosing the most harmonic candidate, candidate (a) in tableau (50), with stress falling on all the enclitics.

(43) Tableau for *comprar*-3P.INF. 'buy-IMP-3.ACC'

/compr+a+r#3.ACC/		OP_{V+Cl}-IDENT(STRESS)	*AL-R(Ft,Cl)
a. ☞	$co_{\mu}m.pra_{\mu}r('lo_{\mu}{}^{\mu})$ $co_{\mu}m.pra_{\mu}r('la_{\mu}{}^{\mu})$ $co_{\mu}m.pra_{\mu}r('lo_{\mu}s^{\mu})$ $co_{\mu}m.pra_{\mu}r('le_{\mu}s^{\mu})$		
b.	$co_{\mu}m('pra_{\mu}r.lo_{\mu})$ $co_{\mu}m('pra_{\mu}r.la_{\mu})$ $co_{\mu}m('pra_{\mu}r.lo_{\mu}s)$ $co_{\mu}m('pra_{\mu}r.le_{\mu}s)$		*!***

In the light of all these analyses, in the next section we discuss alternative approaches in order to frame our proposal into a broader picture and highlight its advantages.

4. ALTERNATIVE ANALYSES AND DISCUSSION

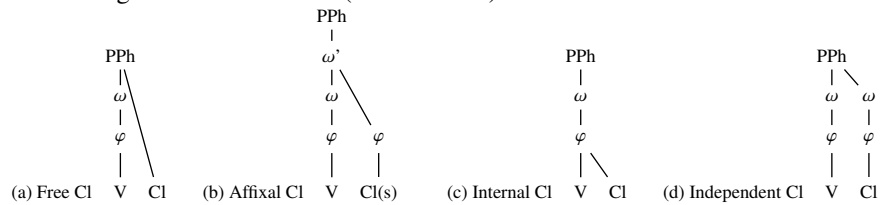
In this section we discuss the analyses for the stress patterns related to encliticisation in Romance varieties (with a particular focus on the ones in Catalan) that have been put forward in the literature and we compare them with the proposal pursued in this paper.

4.1. Clitics and their incorporation into the prosodic hierarchy

According to Selkirk (1995), the most influential work on clitic phonology within OT, clitics can be incorporated prosodically into their hosts in different ways. They can be parsed as dependents of the phonological phrase (44a), as dependents of a recursive prosodic word (44b), as internal clitics within a foot (44c), and as

independent prosodic words (44d). As the prosodic word is the domain for stress assignment, in (44a) the clitic is unstressed and does not affect the position of stress in the host; in (44b) the host-clitic sequence receives one primary stress and one secondary stress; in (44c) the clitic is unstressed (or not) but affects the location of stress, and in (44d), the clitic receives primary stress, as well as the verbal base.

(44) Prosodic organizations of clitics (Selkirk 1995)



Peperkamp (1997), following Selkirk (1995), claims that the stress patterns found in Standard Italian (with stress stability, as Barcelona Catalan), Lucanian (with stress on the penultimate or final syllable, as in Formentera Catalan), and Neapolitan (with stress on the penultimate syllable in combinations of two clitics), can be attributed to a divergent incorporation of clitics into the prosodic hierarchy. This is determined by a specific constraint hierarchy of the constraints on the prosodic hierarchy: Exhaustivity (no C_i directly dominates a C_j, where j < i−1 (e.g. no PWd directly dominates a σ).), Non-Recursivity (no C_i directly dominates another C_i), and Prosodic Faithfulness (prosodic structure in the input should be preserved in the output.).[15] In Standard Italian clitics are incorporated into the Phonological Phrase as a consequence of the ranking Prosodic Faithfulness, Non-Recursive(PWd) ≫ Exhaustivity(PPh); in Lucanian, clitics are incorporated into the prosodic word, obeying the ranking Exhaustivity(PPh), Non-Recursive(PWd) ≫ Prosodic Faithfulness, and in Neapolitan, they are incorporated recursively into the prosodic word, following the ranking Prosodic Faithfulness, Exhaustivity(PPh) ≫ Non-Recursive(PWd).

[15] Prosodic Faithfulness assumes that the prosodic structure of the verbal base up to the level of the prosodic word is part of the input before the process of Stray Adjunction (see also Anderson's 2011 summary of Peperkamp's 1997 proposal).

Trying to apply this schema to the Catalan patterns faces some obvious difficulties. The varieties without stress shift (Barcelona Catalan) could accommodate to the first schema (Standard Italian), although, given this external incorporation of the clitic(s) into the Phonological Phrase, at the border between the verb and the enclitic, one would expect the application of word-final processes such as word-final obstruent devoicing, posttonic /ɾ/ deletion, consonant cluster simplification, etc., and this is not the case (see Mascaró 1985). The varieties with stress shift on the penultimate or final syllable (Formentera Catalan) could accommodate to the second schema (Lucanian), but it would still be unexplained why stress is final in Mallorca and Menorca Catalan, given the constraint hierarchy that regulates stress when no clitics are involved. The crucial argument against a Peperkampian account of our data is, indeed, final stress in Mallorca and Menorca Catalan. The important point here is that for these varieties, assuming that clitics are internal to the prosodic word, as for Formentera Catalan or Lucanian, is not enough. Note how an account with clitics associated to its own prosodic word, independent from the one of the verbal base, as in (44d), would not account for Mallorca and Menorca behaviour either, because, as seen, the verbal base does not preserve the stress.[16]

4.2. Clitics and the cycle

Kenstowicz (1991), and later Bafile (1994), propose that the Neapolitan data can be accounted for by assuming that stress assignment proceeds cyclically. First, stress is assigned to the verbal base. Pronominal enclitics are incorporated postlexically, but the metrical structure built in the previous cycle cannot be

[16] For other drawbacks regarding the application of the prosodic approach to the variety of enclitic stress patterns found in Romance, see Ordóñez & Repetti (2006, 2014) and Repetti (2016). These authors relate final stress shift with the morphosyntactic distinction between weak pronouns and clitic pronouns and their different prosodification: only weak pronouns (which are morphologically more complex, occupy a lower syntactic position, and cannot precede a clitic pronoun in a pronoun cluster) consist of a foot and therefore can affect stress; clitic pronouns, on the contrary, have no metrical structure associated and thus are prosodified as part of the same prosodic word as the verb. This approach cannot be applied to Catalan, because, as seen, pronouns with identical syntactic features and morphological shape behave unlike as far as stress is concerned in different dialects.

altered. Loporcaro (2000) also argues that the crucial difference between dialects showing stress stability, like Standard Italian, and those showing stress shift, like Lucanian and Neapolitan, lies in a parametric choice that determines whether or not stress can be reassigned postlexically. Again, although a cyclic view of stress assignment is useful to account for stress stability versus stress shift, it is insufficient to account for the difference found between Formentera and Mallorca and Menorca Catalan, for instance, which are two dialects with stress shift but with different stress patterns. This means that an accurate account of stress shift under encliticisation transcends any derivational approach and requires a closer look at the specific metrification of the sequences as a whole. Cyclic effects have also been explained in OT by means of output-output faithfulness relations. Such an approach would easily account for the difference between stress stability (in which the stress location in the encliticised form must be faithful to the position of stress in the non-encliticised, isolated verbal form) and stress shift (in which output-output faithfulness is sacrificed in order to avoid a marked stress structure). Still, this approach would again leave unexplained the differences in stress patterns associated with those systems displaying stress shift.

4.3. Specific grammar for Mallorca and Menorca encliticisation and an iambic approach

Grimalt (2002) is the first formal study that we are aware of that focuses on the stress patterns related to encliticisation in Mallorca and Menorca Catalan. He concludes that the verb plus enclitic(s) combinations ending in a consonant ([do(ˈnəm)] ‘give me’, [do.nə(ˈmos)] ‘give us’, [do.nəm(ˈmos)] ‘to give to us’) can be analysed following the unmarked stress pattern of Catalan already described in Serra (1996) and Vallverdú (1997). As for the verb plus enclitic(s) combinations ending in a vowel ([do.nə(ˈli)] ‘give to him/her’, [do.nəm(ˈmə)] ‘to give me’, [do.nə(ˈɾo)] ‘to give it’), the author acknowledges that they escape from the unmarked stress pattern of Catalan, and this is why he resorts to a constraint Align-Left(Clitic, Foot), according to which the left edge of a clitic must coincide

with the left edge of the foot. This constraint, ranked above FOOT-BINARITY, ensures the selection of candidates with monomoraic feet over otherwise more harmonic candidates with a trochaic structure and satisfying FOOT-BINARITY, like the forms found in Formentera Catalan. In order to account for final stress in sequences containing more than one enclitic as in [do.nəm.mon.ˈnə] 'to give some to us', the author assumes that prosodic words with more than one foot are built ([do.nəm(ˈmon)(nə)], [do.nəm(mon)(ˈnə)]), and that the constraint ALIGN-Right(Head, PWd) is responsible for selecting the one with the second clitic parsed as the prosodic word's head. This approach, as the author acknowledges, has a clear drawback—the generation of marked structures, that is, monomoraic feet. On the other hand, the other alignment constraint that is put forward by the author, ALIGN-Left(Clitic, Foot), just explains the behaviour of Mallorca and Menorca Catalan—and still with difficulties for cases with clitics whose underlying representation is just a vowel and the clitic is not left-aligned with the foot [do.nə(ˈɾo)] 'to give it'—, and has nothing to say about the behaviour of the rest of Catalan varieties, including Formentera Catalan. In order to avoid the generation of a typologically marked pattern with monomoraic feet, Grimalt (2004), following Wheeler (2004), assumes (i) that Catalan has default iambic stress and (ii) the existence of the colon, a prosodic category that stands between the foot and the prosodic word. It is not our purpose in this section to explain the details of Grimalt's (2004) analysis, but two general concerns arise from this perspective. First, the colon is not a widely accepted prosodic category. Second, assuming that Catalan has iambic feet contradicts well known facts of truncation patterns in Catalan (Cabré 1993), among other aspects. But the problem with assuming that encliticised sequences in Mallorca and Menorca Catalan apply an iambic pattern is the existence of the perfectly right-aligned moraic trochee pattern found in Formentera Catalan. It is precisely this pattern found in Formentera Catalan that gives additional support to the hypothesis that Catalan is a weight-sensitive trochaic language.

5. FINAL REMARKS

In this paper, we have shown that our prediction that the encliticisation stress patterns conform to the unmarked nominal stress system of Catalan is correct. Beyond that, the fact that verb-enclitic groupings behave as nominal forms with respect to stress assignment and differ from verbal forms is not as idiosyncratic as it could seem, since enclitics are pronouns.

Let us summarise what we see as the advantages of our analysis of pronominal enclitic-induced stress shift in Catalan. First, there is no need to postulate different prosodic incorporation sites for different dialects (cf. Peperkamp 1997); we have claimed that in all Catalan dialects under study pronominal enclitics are not parsed outside the prosodic word, although in Barcelona Catalan enclitics misalign with the foot right edge. We could still allow enclitics to directly attach to the Phonological Phrase node for Barcelona Catalan, as Peperkamp (1997) suggests for Standard Italian. However, the difference between Formentera Catalan on the one hand and Mallorca and Menorca Catalan, on the other, would still need to rely on an additional mechanism, which our analysis identifies as catalexis. Therefore, resorting to different prosodic incorporation strategies does not account for the whole set of the facts. Second, by resorting to catalexis, the hypothesis that stress shift is always driven by the avoidance of marked stress patterns (penultimate stress in consonant-final verb-enclitic groupings and antepenultimate stress) can be maintained for all dialects (in contrast with Grimalt 2004, who resorts to iambic feet to account for final stress in Mallorca and Menorca Catalan); both in Formentera Catalan and in Mallorca and Menorca Catalan, the result is a right-aligned moraic trochee, which is the unmarked foot in Catalan. Third, the use of the anti-alignment constraint *ALIGN-Right(Foot, Clitic) not only accounts for the Barcelona Catalan data, but is precisely the constraint that also drives final stress in Mallorca and Menorca Catalan. No third constraint is needed to account for either Barcelona or Mallorca and Menorca Catalan. Finally, the different stress shift pattern found in Formentera vs. Mallorca and Menorca Catalan finds a strictly phonological explanation in our analysis, and we have demonstrated that

the distinction between weak pronouns and true clitics is not enough to account for the differences found between Balearic Catalan dialects.

Overall, with this study, we hope to broaden the understanding of the phonology of cliticisation in Romance in general and in Catalan in particular.

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