

Syntactically Driven Cyclicity vs. Output-Output Correspondence: The Case of Adjunction in Diminutive Morphology*

Asaf Bachrach and Michael Wagner

1 Introduction

This paper presents a unified analysis of two puzzles regarding diminutive formation in Brazilian Portuguese (BP). We claim that the quasi-complementary distribution of the two forms of the diminutive, /ijɐ/ and /ziɐ/, as well as a number of phonological and morphological differences between diminutive suffixation and the canonical suffixation pattern are due to their syntactic structure.

We propose that the diminutive is an adjunct while (most) other suffixes in BP are heads. Using an analogy to co-compounding, we demonstrate that the diminutive exhibits the general morphological properties of adjuncts. The phonological over-application attested in the diminutive is due to the fact that the stem and the diminutive go through independent cycles. The two different forms of the diminutive reflect a difference in the syntactic scope of the adjunction. New data regarding the semantics of the two diminutive forms corroborate this syntactic distinction.

Ferreira (2004) proposes an account of the diminutive formation in terms of trans-derivational Output-Output correspondence constraints which have the effect that phonological properties of the diminutive are imported from the unaffixed base. We argue that such an account not only lacks the predictive power of the account developed here (in particular with respect to the scope differences), but is also empirically lacking.

The syntactic account ties together the phonological, morphological and semantic facts and explains the observed overapplication effects without trans-derivational constraints.

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2 Overapplication in Diminutive Affixation

Diminutives differ from other derivational affixes in their phonology. They display cases of apparent counter-feeding opacity (cf. Menuzzi, 1993; Lee, 1999; Ferreira, 2004, i.a.), as can be observed in the process of nasalization. Derivational affixes attract the stress, and the unstressed stem vowel fails to undergo nasalization (1a). In diminutives, the stem vowel nasalizes, despite of not being stressed (1b) or only carrying secondary stress (1c):

- (1) Regressive nasalization
- | | | | |
|----|--------|----------------|--------------------|
| a. | 'fām-a | fa'm-os-o | 'fame', 'famous' |
| b. | 'cām-a | cā'm-ĩj̃-a | 'bed', 'small bed' |
| c. | 'cām-a | ˌcām-a 'zĩj̃-a | 'bed', 'small bed' |

The [+/- ATR] contrast is usually lost when stress is shifted away from the stem due to suffixation (2a), but this is not the case with diminutives (2b,c):

- (2) Cyclic Stress Effects: [+/- ATR]
- | | | | |
|----|--------|----------------|------------------------|
| a. | 'beɫ-o | be'l-ez-a | 'beautiful', 'beauty' |
| b. | 'bəl-a | bɔ'l-ĩj̃-a | 'ball', '(small) ball' |
| c. | 'bəl-a | ˌbəl-a 'zĩj̃-a | 'ball', '(small) ball' |

These phonological peculiarities correlate with a cluster of morphological properties (Lee, 1999; Ferreira, 2004). We propose that the facts can be accounted for by analyzing the diminutives as modifying adjuncts.

3 A Case of Adjunction: Co-Compounds

What are the properties of adjuncts? Adjuncts tend to be optional, they do not project, and in Romance languages they often agree in gender and number with their host (c.f. Bierwisch, 2003; Schütze, 1995, for discussion of properties of adjunction); semantically, adjuncts often combine with the meaning of their host by predicate modification (Heim and Kratzer, 1998). There is one type of compounding in BP that exemplifies all of these properties, namely coordinate compounds (co-compounds). The first conjunct is the head, i.e. it determines the grammatical properties, e.g. gender:

- (3)
- | | |
|----------------------|--------------------------------|
| um porco zebra belo | 'a beautiful pig-zebra' (mas.) |
| uma zebra porco bela | 'a beautiful zebra-pig' (fem.) |

A further indication that the first conjunct is the head is that the second conjunct agrees with the first conjunct in gender where possible:

- (4) profesora vampira profesor vampiro
 ‘vampire teacher’ (fem.) ‘vampire teacher’ (masc.)

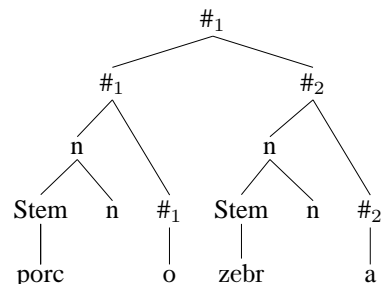
The second conjunct also agrees in number with the first conjunct:

- (5) presidente ministro (sg.) presidentes-ministros (pl.)
 ‘minister-president’ (s.o. who is both at the same time)

Co-compounds get an intersective interpretation, e.g. (4) refers to someone who is a vampire and a teacher at the same time, as would be expected if they compose by predicate modification.

Based on the observation that plural is marked on both conjuncts, we propose that co-compounds are a case of adjunction to a Number Phrase.¹

- (6) Syntactic Structure of Co-Compounds



[porco zebra] ‘pig zebra’

The first number phrase ($\#_1$) is the host, the second is the adjunct. This is why the first conjunct determines the gender of the compound. The theme vowel can be analyzed as an exponent of the number head. This structure accounts for why each conjuncts receive a separate theme vowel, and it also accounts for why each compound receives separate but agreeing number marking (as shown in 5).

What is the expectation for the phonology of adjunction? According to Marantz (2001); Marvin (2002); Arad (2005), categorial heads such as *n* are phase heads that trigger the spell-out of their sister. Each cycle is assigned a stress. We thus expect two separate cycles for each conjunct based on the structure in (6). Co-compounds indeed show two separate word stresses on each conjunct. The pre-nasal vowel in (7) is nasalized even when the word is the first member of a compound:

¹Number phrases were first argued for in Ritter (1991). Coordination is more generally analyzed as adjunction in (Munn, 2000).

- (7) ₁sofa-c'ãma, cãma-'sofa 'sofa/bed'

Another relevant observation regards secondary stress. If the two stresses become adjacent, the first one is removed:

- (8) ca'fe 'bar ₁cafe-'bar 'coffee/bar'
 jor'nal 'livro ₁jornal 'livro 'newspaper/book'

This can be interpreted as a rhythmic effect, and can be captured by a process of clash-removal that shift the stress when the two conjuncts are put together and jointly undergo a cycle.²

4 Diminutives in BP are Adjuncts

Having identified a number of phonological and syntactic properties of adjunction, we now return to diminutive formation. We observe that derivational suffixes exhibit properties of syntactic heads while the diminutive morpheme patterns with adjuncts.

Derivational suffixes project, i.e. they determine the category of the derivative (9b); diminutives on the other hand preserve the category of the base (9c,d):

- (9) Category of Derivative
- | | | |
|----|--|--|
| a. | amig-o _N 'friend' | pequẽn-o _{Adj} 'small' |
| b. | amig-áve _{Adj} 'friendly' | pequẽn-ur-a _N 'smallness' |
| c. | amig-ĩj-o _N 'friend' (dim) | pequẽn-ĩj-o _{Adj} 'smallish' |
| d. | amig-o zĩj-o _N 'friend' (dim) | pequẽn-o zĩj-o _{Adj} 'smallish' |

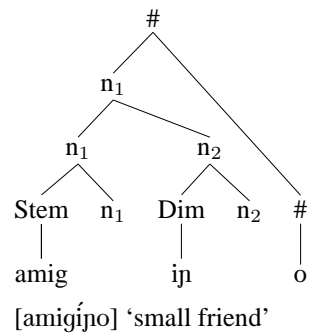
Agreement points in the same direction. While derivational affixes determine the inflectional class and gender of the derivative (10a), diminutives agree with their host (10b,c):

- (10) Declension Class of Derivative (Pottier 1953)
- | | | | |
|----|----------------|-------------------|-----------------|
| a. | porc-o (masc.) | porc-ãd-a (fem.) | 'bunch of pigs' |
| b. | zebr-a (fem.) | zebr-ĩj-a (fem.) | 'small zebra' |
| c. | porc-o (masc.) | porc-ĩj-o (masc.) | 'small pig' |

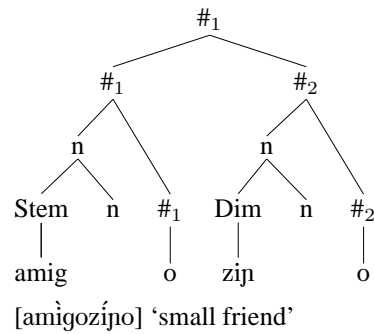
These characteristics indicate that diminutives are adjuncts. But where exactly do diminutives attach? We propose that the diminutive morpheme can adjoin at different heights, either below or above the number node:

²See Sandalo and Truckenbrodt (2002) for a discussion of rhythmic effects in Brazilian Portuguese.

(11) /ip/-Adjunction

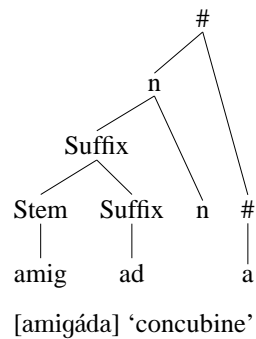


(12) /zip/-Adjunction



Other derivational affixes attach as heads taking the stem as their complement:

(13) Derivational Suffix



This analysis captures the fact that the diminutive can never appear 'inside' any derivational affix:³

(14) *porqu-ĩn-ad-a (intended meaning: 'a bunch of small pigs').

In our analysis, both co-compounds and the higher diminutives involve adjunction to a number phrase.⁴

³Stump (1993) argues that this is crosslinguistically a common property of diminutives.

⁴In fact, *zĩpo* can be used as a noun in isolation, furthering the similarity between compounds and *zĩpo* (Nevins p.c.).

The phonological peculiarities of the diminutives are a consequence of the syntax-phonology mapping. Each sister of a categorial head undergoes a phonological cycle, and the structures in (11, 12) predict that both base and diminutive should undergo separate cycles and thus receive separate stresses. The segmental facts in section 2 indeed give evidence for two stress domains. When the stressed syllable of the stem is adjacent to the stress on the diminutive, post-lexical clash removal will delete it, just as in the case of co-compounds (8).

The analysis in terms of a single diminutive taking different scopes makes syntactic and semantic predictions. A first piece of evidence already observed above is that /ip/ attaches inside and /zip/ outside the theme vowel of the stem.

Further evidence comes from the choice of theme vowel, an observation due to Pottier (1953). In BP there is an exceptional declension class, in which masculine nouns take the theme vowel *a* instead of the regular *o*. In the case of affixation with /ip/, the theme vowel chosen is the theme vowel corresponding to the declension class of the noun, whereas in the case of /zip/, the theme vowel reflects the gender but not the declension class of the host. This is as expected if /ip/ adjoins to *n* and /zip/ to #.

- (15)
- | | | | |
|----|--------|--------------|------------------------------|
| a. | poet-a | poet-ĩp-a | ‘small poet’ (fem. or masc.) |
| b. | poet-a | poet-a zĩp-o | ‘small poet’ (masc) |
| c. | poet-a | poet-a zĩp-a | ‘small poet’ (fem.) |

If the diminutives can really take different scopes this should also be reflected in their scope relative to other modifiers. Indeed, /ip/ takes narrow scope with respect to prenominal adjectives, whereas /zip/ takes wide scope. This is evidenced by the fact that idiomatic readings of adjective-noun collocations are lost in /ip/-diminutives, as expected if the diminutive affix attaches low and ‘breaks up’ the idiom, whereas affixation with /zip/ is fine, reflecting its high attachment sight:

- (16)
- | | | |
|----|-------------------|--------------------|
| a. | super amigo | ‘super hero’ |
| b. | ??super amiginho | ?? |
| c. | super amigo zinho | ‘small super hero’ |

Another example:

- (17)
- | | | |
|----|--------------------|------------------------------|
| a. | bom conselho | ‘good advice’ |
| b. | ??bom conselhino | ?? |
| c. | bom conselho zinho | ‘small piece of good advice’ |

There is more direct evidence for the claim that /ip/ attaches within the number

projection and /zip/ outside. The different attachment height results in subtle semantic differences. Consider the following scenario:

- (18) Cristina and Flora are on a safari. In front of them are two big elephants, 3 smaller zebras and two bigger zebras.
- a. zebrazinhas ‘zebras that are small’
 - b. zebrinhas ‘small zebras’

If Cristina wants to point to all the zebras, she cannot refer to them with (18a) but must use (18b; if Cristina uses (18a), Flora will turn her attention to the subset of the three *small* zebras. This suggests that /ip/ really modifies the predicate ‘zebra’, whereas /zip/ picks out a proper subset of a plurality of ‘zebras’, i.e. it applies to the extension of an NP constituent.

The semantics of the high diminutive is similar to that of a restrictive relative clause. Compare the following contrast:

- (19) At a Conference:
- a. Look at those linguists that are happy (must be a proper subset)
 - b. Look at those happy linguists! (could be the entire audience)

The reason the restriction of extensional noun phrases in the preceding examples requires proper subsets might be pragmatic in nature, as discussed in Schlenker (2004).

In the examples discussed so far, the use of either /ĩp/ and /zĩp/ is not optional or simply a case of phonotactically driven allomorphy. The choice of form reflects the attachment site. The difference in scope is reflected in the morphological, syntactic, and semantic characteristics of the diminutive. But how can one explain the different phonological shape of the affix if the only difference between the different diminutives is the attachment height?

5 Allomorphic Variation

The diminutive can take different scopes. In the examples so far, the high diminutive is pronounced [zĩp], while the low one is pronounced [ĩp]. This section presents evidence that the shape of the diminutive is predictable, but actually does not reflect attachment height but is due to the phonological environment.

The presence of the [z] in the diminutive, we claim, is due to a process of [z] insertion that applies whenever adding an affix creates a hiatus:⁵

$$(20) \quad \emptyset \rightarrow [z] / V \text{ [affix]} ___$$

This process applies to affixation in general. For example, affixation with ‘al’ requires [z] insertion (21a) unless the base ends in a consonant (21b):

- (21) a. cafe ‘coffee’ cafe-z-al ‘coffee grove’
 b. laranj-a ‘orange’ ‘orange’ laranj-al ‘orange grove’

This process of [z]-insertion correctly derives the shape of the two diminutives typically observed:

- (22) zebra: zebr-inh-a, zebr-a-zinh-a

Our analysis predicts that even the low diminutive should be pronounced [zĩɲ] if the stem ends with a vowel, thus making high and low diminutive phonologically indistinguishable. Indeed, words that end with an underlying vowel cannot be affixed with [ĩɲ]:

- (23) café ‘coffee’: *cafeinho, cafezinho

This approach can be further motivated based on the class of nouns that lack a theme vowel. We analyze this class of nouns as being formed by an *n* head that consists of an empty vowel. This empty vowel prevents the insertion of a theme vowel (24a), a restriction independently needed for the case of vowel final stems (24):

- (24) a. flor *flor-a ‘flower’
 b. café *café-o ‘coffee’

In cases of affixation outside of *n*, this empty vowel triggers the rule in (20), and consequently nouns in this class always take a diminutive with an initial [z], just like stems with an *underlying* final vowel:

- (25) flor ‘flower’: *florinha, floxzinha

Once again, as a result, the high and low diminutive are identical. Treating the empty vowel as an exponent of *n* captures the fact that in this class [z] is *not* inserted when a vowel-initial affix such as ‘-eiro’ attaches directly to the stem rather than outside *n* (26a), in contrast to words with an underlying final vowel (26b):

⁵Alternatively this could be analyzed as phonologically conditioned allomorphy, but this would require postulating two different allomorphs for all affixes.

- (26) a. cafe cafezinho cafezeiro ‘coffee producer’
 b. flor florzinho floreiro ‘gardener’

The analysis thus predicts correctly that exactly those words that do not take a theme vowel necessarily form diminutives with [zĩɲ] (cf. Menuzzi, 1993, and references therein).⁶ Furthermore, it makes the additional prediction that the two diminutives will sometimes be disambiguated in the plural (27b vs. c):

- (27) Two different output forms for plural diminutives of ‘flor’
- | | sg. | pl. |
|----|--|---|
| a. | flox | flores |
| b. | [[[flox] _n [zinh] _n]a] _{num} | [[flox] _n [zinh] _n] a s] _{num} |
| c. | [[flox] _{num} [zinha] _{num}] _{num} | [[flores] _{num}][inhas] _{num}] _{num} |

The emergence of two different plural forms is just as expected if the diminutive can either attach above or below number. Our analysis furthermore predicts that these two possible plural forms differ in their interpretation:

- (28) ‘Look at the flowers (dim)!’ Different interpretation depending on which form is used:
- a. floxzinhas ‘flowers that are small’
 - b. florezinhas: ‘little flowers’

Finally, the analysis explains the plural morphology in diminutives. The presence of a plural affix can be tested by a palatalization process on laterals that is triggered by affixal [z] (29b). It is not triggered not by other following sibilants, e.g. if a [z]-initial modifier follows (29c):

- (29) a. jornáw ‘newspaper’
 b. jornáj-s ‘newspapers’
 c. jornáw zoológico ‘zoological journal’

In the plural the low diminutive is marked with a single plural affix (30b), while the high diminutive is marked with two plural affixes (30c), one on the base and one on the diminutive, just as in co-compounds (30a):

- (30) a. jórnaw lívro (sg) jornájs lívros (pl) ‘newspaper-booklet (s)’
 b. jornáwzĩɲo (sg) jornáw-zĩɲos (pl) ‘small newspaper(s)’
 c. jornáwzĩɲo (sg) jornájs-ĩɲos (pl) ‘small newspaper(s)’

⁶We leave aside the class of nouns with final unstressed [e] for the purpose of this paper, which would require a more extensive discussion.

Contrary to earlier analyses we claim that the correct parse of plural forms such as *jornájzĩjos* is *jornáj-s +ĩjos*. The plural affix /s/ triggers the palatalization of the lateral, and is then resyllabified as the onset of the diminutive and bleeds [z]-insertion on the suffix.

This makes another novel prediction. In co-compounds in which the second conjunct begins with a [z], there should be two [z] in the plural: one is due to the plural morpheme, and one is the onset of the second conjunct; by contrast, there should be a single [z] in the diminutive, since plural affixation bleeds [z]-insertion. While the two [z] in co-compounds are often degeminated in fast speech, very careful speech uncovers this subtle difference:

(31) Judgments in very careful speech

põrcozebras *põrcozzebras* *pig-zebras*
jornajzĩjos **jornajzzĩjo* small newspapers

6 Output-Output Correspondence Revisited

Ferreira (2004) posits that the diminutive and the inflected base are in a privileged paradigmatic relation since they share the same head. Changes due to plural suffixation in the base are imported to the stem in diminutives via O-O-correspondence constraints. The choice between /iɲ/ and /ziɲ/ is also guided by O-O correspondence. We present two problems for this account which we believe reflect a more general shortcoming of the paradigmatic perspective.

6.1 O-O-Overapplication

The tableaux in (32) exemplifies the O-O-correspondence analysis of phonological over-application due to stress:

(32) Stress-induced [+atr]-alternation imported from base

base: bóla	/bóla/ + /iɲa/	IDENT-OO	*ɛ, ɔ -STRESS	IDENT-IO
a. bolíɲa			*	
b. bolíɲa		*!		*

The O-O constraint in (33) makes reference to the *plural* base when the plural diminutive is evaluated (the vowel in the singular /pork/ is [-atr]):

(33) Allomorphic [+atr]-alternation imported from base

/porko/+/ipo/+/s/ base: pórkos	IDENT-OO	*ε, ɔ -STRESS	IDENT-IO
a. pórkiɲos		*	*
b. porkiɲos	*!		

Ximenes (2006)) notes a case of over-application where the plural diminutive appears to be faithful to the *singular* base:

- (34) a.
 b. axɔjs ‘rice’ (sg.) axɔs-es (pl.) ‘rice’
 axɔj-zĩɲ-o ‘small rice’ (sg.) axɔj-zĩɲ-os (pl.) ‘small rices’

Diphthongization applies regularly to stressed vowels before a tautosyllabic (and tauto-morphemic) [s]. That stress plays a role in the structural description is evidenced from the lack of diphthongization when stress is not final:

- (35) cáct[u]s, lóg[o]s, lóť[u]s (*cáct[u]s, *lóg[o]s, lóť[u]s)

An OT analysis of this phenomenon is sketched in (36)⁷:

(36)

/arróz/	$\check{V}=\check{V}_j/_\perp S.$	DEP V I-O
a. arrójz		*
b. arróz	*!	

(37)

/arróz/+/s/	$\check{V}=\check{V}_j/_\perp S.$	DEP V I-O
a. arrózes		*
b. arróizes		**!

Under the assumptions made by Ferreira’s account, O-O correspondence is be ordered above I-O faithfulness. While this is unproblematic in the case of the singular (38), the plural diminutive, which is evaluated with respect to the *plural* base, is wrongly predicted not to surface with a diphtong (39):

(38)

/arróz/+/ipo/	IDENT-OO	$\check{V}=\check{V}_j/_\perp S.$	DEP V I-O
base: arrójz			
a. arrojíɲo			*
b. arrozíɲo	*!		

(39)

/arróz/+/ipo/+s/	IDENT-OO	$\check{V}=\check{V}_j/_\perp S.$	DEP V I-O
base: arrózes			
a. arrojíɲos	*!		*
b. arrozíɲos			

⁷The constraint $\check{V}=\check{V}_j/_\perp S.$ in (36) is a place holder for a fuller analysis of this phenomenon but is sufficient for our purposes

6.2 Allomorph Selection

In Ferreira's analysis, /ɨp/ or /zip/ are chosen depending on which affix will allow a more faithful rendition of the inflected base. The shape of the base depends on the shape of unaffixed plural and singular forms:

(40) Singular *flor* 'flower'

	flór	* _r IN CODA	DEP V I-O	IDENT C I-O
☹	a. flóx			*
	b. flór	*!		
	c. flóre		*!	

(41) Plural

	flór+s	*COMPLEX	* _r IN CODA	DEP V I-O	IDENT C I-O
☹	a. flóres			*	
	b. flórs		*!		
	c. floxs	*!			

While O-O-faithfulness will generate the correct output in some cases, it fails in others. A correct expectation is that /zip/ is chosen in the singular in order to preserve the quality of /ɾ/ in the uninflected base:

(42) Allomorph selection in singular

	/flór/ + DIM base: flóx	* _r IN CODA	DEP V I-O	ID. O-O	ID. C I-O
☹	a. floxzíjɐ				*
	b. floríjɐ			*!	

But the theory makes a wrong prediction for the plural form:

(43) Allomorph Selection in Plural

	/flór/ + DIM+s base: flóres	* _r IN CODA	DEP V I-O	ID. O-O	ID. C I-O
☺	a. floxzíjɐs			!*	*
☹	b. floríjɐs				

[florinhas] is wrongly chosen over the correct form [floxzinhas]. The actual output is unfaithful to both quality of /ɾ/ and syllable structure of the plural base, contrary to the predictions of the paradigmatic account..⁸

⁸Ferreira postulates a single morphological structure for all cases of diminutive formation. The scope data presented in section 4 argues that at least for certain words,

7 Conclusion

In this paper we have argued for an analysis of diminutive formation in BP in terms of syntactic adjunction. This analysis, combined with a cyclic view of syntax, provides a principled account of a number of morpho-phonological peculiarities of the diminutive. In particular, it accounts for apparent cases of counter-feeding opacity. Positing that the diminutive can take different scopes—a general property of adjuncts—allows for a unified account of the different diminutive forms.

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diminutives with both /zip/ and /ip/ exist, a fact which is not captured by O-O allomorphy selection. But even restricting our attention to the low diminutive, the proposal fails. Notice that while the form *florezipas* is also attested, and *does* seem to preserve the quality of the /r/ in the plural base, we have argued, based on semantic grounds, that this form must be a case of the *high* diminutive.

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Michael Wagner
 Department of Linguistics
 Cornell University, ML216
 Ithaca, NY 14850
chael@cornell.edu

Asaf Bachrach
 Department of Linguistics and Philosophy
 Massachusetts Institute of Technology
 77 Massachusetts Avenue 46-4037
 Cambridge, Ma. 02139
asaf@mit.edu

8 Appendix: Secondary Stress

This appendix illustrates how the analysis presented in this paper captures secondary stress facts that were used to argue for two different diminutive morphemes in earlier approaches.⁹ We have already presented evidence that the stress facts of diminutives formed with /zip/ are just like in the case of co-compounding and involve two stresses. This is less obvious in the case of /jp/. In fact, Menuzzi (1993) argued that diminutives built by /jp/ have a stress pattern similar to that of derivational affixes. In monomorphemes and derivatives, secondary stress is placed on every other syllable preceding the main stress:

	Ultimate	Penult	Antepenult
(44)	bár	pórcó	pérola
	jornál	tomáte	anáfora
	jògadór	àgradável	àlmucábala
	maràcaná	elèonóra	
	càtalizadór	pìndamònhangába	pàralèlepípedo

Menuzzi (1993)'s point is that in the case of /jp/, the emerging stress pattern is just like in derivatives, whereas in the case of /zip/, secondary stress simply reflects the lexical stress of the base.

(45)	/zip/	pérola	pèrola zínho	*peròlazínho
	/jp/	gèneróso	*gèneròsínho	genèrosínho

But this argument ignores the role of clash removal. Consider again clash removal with /zip/ in words that lack a theme vowel (46):

(46)	Clash Removal for /zip/ o/		
	már	marzínho	'small sea'
	jornál	jòrnalzínho	'small newspaper'
	repórter	repòrterzínho	'small reporter'
	pérola	pèrolazínha	'small pearl'

The only difference between /jp/ and /zip/ is that the latter is often separated from the base by an additional theme vowel. The stress facts in the case of /jp/ are entirely compatible with an analysis that preserves the stress on the base, and postlexically removes clashes:

⁹The appendix will not appear in the printed proceedings.

(47) Clash Removal for /ijo/

pórc	porquínho	‘small pig’
tomá	tomatínho	‘small tomato’
carótida	carotidínha	‘small carotid’

Therefore, stress does not form an argument for a phonological difference between /ij/ and /zj/ beyond the presence of initial [z], and apparent differences are just due to different syllable counts in the forms they typically occur in.

A second issue related to secondary stress regards the compound status of diminutives affixed with /zj/. Treating /zijo/ as equivalent to a compound structure stands in contradiction to recent arguments based on stress and number marking that diminutives behave differently from compounds:

- (48) a. Stress Shift in case of Clash: *cirurgião médico* vs. *jornalzinho* (Menuzzi, 1993)
 b. Plural: *carros-bomba* vs. *zebra zinhos* (Lee, 1999; Ferreira, 2004)

These authors, however, made comparisons to the wrong kind of compounds. Three types of compounds need to be distinguished:

- (49) a. Synthetic: *Buffy, the vampire slayer*. (person who slays vampires)
 b. Analytic: *She has a pocket slayer* (slayer gadget that fits in her pocket).
 c. Coordinate: *Angel, the vampire slayer*. (slayer who is also a vampire)

In BP, they can be told apart based on where the plural morpheme is realized:

(50) Types of compounds and Plural Marking

a. Synthetic	guarda chuva	guarda chuva-s	umbrella(s)
b. Analytic	carro-bomba	carro-s bomba	car bomb(s)
c. Coordinate	presidente ministro	presidente-s-ministro-s	president-minister

Menuzzi (1993) compared diminutives to synthetic compounds while Lee (1999) and Ferreira (2004) compared them to analytic compounds. As discussed in section 3 of this paper, co-compounds show double plural marking and stress shift just like diminutives.