

Boundary strength and linguistic ecology (Mostly exemplified on intervocalic /s/-voicing in Italian)

Pier Marco Bertinetto

Abstract

This paper addresses the issue of intervocalic /s/-voicing in Italian along the lines of the recent proposal put forth by Loporcaro (1995; 1999), and adds further arguments to support his plea for the use of a hierarchy of morpheme boundaries instead of the now prevailing approach consisting of assigning the various phonological processes to different prosodic tiers. It is shown that none of the attempts carried out within the framework of prosodic phonology captures the linguistic data in a satisfactory way.

The problem of intervocalic /s/-voicing is viewed in light of the strategy most often adopted by natural languages, which consists of protecting morpheme-initial segments from the operation of phonological rules that might alter their identity, hence posing a challenge to the task of language understanding. However, apart from the existence of various exceptions, it is claimed that this functional strategy is no more than a tendency, for even in the case at issue the efficiency of the system is far from perfect. Ultimately, the lexical competence of the speaker plays a decisive role in recognising morpheme-initial segments in the flow of speech, even though the application (or lack of application) of the relevant morphophonological rule provides useful information.

1. Strength scales for morpheme boundaries*

The protection of segments' identity at morpheme boundaries may be regarded as an important ecological (i.e. ultimately, functional) need for language users. Its function may be easily understood: it helps the hearer identify the intended (by the speaker) lexical unit. It plays, therefore, a crucial role in lexical access. This has repeatedly been assessed in experimental psycholinguistics, e.g., in the literature concerning the phoneme monitoring technique (see for instance Cole 1973 and Cole & Jakimik 1978; and see Hawkins & Cutler 1988 for a general review of the problem).

This also yields a decisive advantage for the language learner. It is thus no wonder that many languages exhibit this phenomenon. In fact, many languages refrain from applying, at morpheme boundaries, phonological processes that

would otherwise occur. However, this is not an inviolable rule:¹ there do exist languages where this ecological principle is not implemented. One such example is the Logudorese variety of Sardinian, where voicing of intervocalic obstruents occurs across the board, even at the postlexical level. The following data, referring to the vernacular² of Bonorva, are taken from Loporcaro (1999) and provide examples for intervocalic /S/:³

- | | | | | |
|-----|----|--------------------|----------------|-----------------|
| (1) | a. | [sɛna zamu'naðu] | 'not washed' | (← /samu'naðu/) |
| | b. | [trinta 'zɛt:ɛ] | 'thirty-seven' | (← /'sɛt:ɛ/) |
| | c. | [lu 'zamuno] | 'I wash it' | (← /'samuno/) |
| | d. | [las:az im 'pa:zu] | 'let in peace' | (← /'las:as/) |

Another example that could be cited in this connection is Faliscan (an ancient Italic language once spoken in Southern Italy), where, according to Bonfante (1966), /S/ seems to be voiced intervocalically in all contexts.⁴ Obviously, the testimonies of the inscriptions are not fully consistent. However, the following examples indicate the prevailing tendency:

- | | | | |
|-----|----|-----------------------|---|
| (2) | a. | folcozeo zextoi | 'Folcosius Sexti' (= 'F. son of S.') |
| | b. | sesto | 'Sextus' (= 'a person name') |
| | c. | letezot | 'lecti sunt' (= 'have been collected') |
| | d. | de zenatuo.sententiad | 'de senatus sententia' (= 'about the sentence of the senate') |

Note that the same person name occurs in two different spellings in (a-b), depending on the context. In practice, word-initial /S/ tends to appear with the sign for <z> when preceded by a vowel-final word, as we may also gather from (c-d).⁵ Note further that in these inscriptions word-internal intervocalic /S/ tends by and large to show up voiced, as in (a) (*folcozeo*).

The situation in Logudorese Sardinian and Faliscan is clearly an exception. Natural languages exhibit, as a rule, some reluctance to phonological change at morpheme boundaries. Not all boundaries, however, have the same strength. In recent contributions, Loporcaro (1995; 1999) proposed a very interesting overall picture for the rule of intervocalic /S/-voicing in Romance. The following table, taken from the first source, indicates the strength hierarchy with specific reference to situations where the morpheme boundary is located at the left of the fricative, i.e., where /S/ is the morpheme-initial segment.⁶ As may be seen, the rule of intervocalic /S/-voicing receives different implementations in different Romance varieties (in (3) I limit myself to Standard Italian and French; see below for further details on these two languages):

(3)			stronger		/S/-voicing	
	a. word / word	boundary		6	-	-
	b. clitic / host	boundary		5	-	-
	c. stem ₁ / stem ₂	boundary		4	-	-
	d. prefix / stem	boundary		3	-	-
	e. stem / der.suffix	boundary		2	?	?
	f. stem / infl.suffix	boundary		1	?	+
	g. no	boundary		∅	+	+
			weaker		Italian	French

Loporcaro also considers the situations where [S] is morpheme-final, i.e., where the morpheme boundary is located at the right of the fricative. We may arrange these two classes of situations as in a sort of continuum, having the ∅ condition (no boundary) as kernel, and two scales of increasing strength on both sides. The following diagram is an attempt at visualising the situation. The integers from <1> to <6> receive the same interpretation as in (3) above in terms of the strength parameter, but they are now either preceded or followed by a '+' sign, indicating the position of the boundary with respect to the target phoneme. See (5-6) below for some concrete illustrations.

(4)	boundary to the right	no boundary	boundary to the left
	6+ 5+ ... 2+ 1+ ∅ +1 +2 ... +5 +6		

Here follow, again from Loporcaro (1995) but with some modifications, the relevant examples for Standard Italian and French. Note that not all the conditions above ∅ are reproduced below this level, for some do not seem to occur in the languages considered (e.g., there are virtually no examples of stem₁/stem₂ with an [S]-final stem₁):⁷

(5) *Standard Italian*

a.	word/word	boundary	+6	[s]	<i>da [s]olo</i>	'alone'
b.	clitic/host	boundary	+5	[s]	<i>lo [s]ento</i>	'I feel it'
c.	stem ₁ /stem ₂	boundary	+4	[s]	<i>para[s]ole</i>	'sun-shade'
d.	prefix/stem	boundary	+3	[s]	<i>a[s]ociale</i>	'asocial'
e.	stem/der.suffix	boundary	+2	?	-	
f.	stem/infl.suffix	boundary	+1	?	-	
g.	no boundary		∅	[s/z]	<i>Pi[s]a batte[z]imo</i>	'a place name' 'baptism'
h.	stem/infl.suffix	boundary	1+	[s/z]	<i>ca[s]a ro[z]a</i>	'house' 'rose'
i.	stem/der.suffix	boundary	2+	[s/z]	<i>ca[s]ata ro[z]eo</i>	'lineage' 'rosy'
j.	prefix/stem	boundary	3+	[z]	<i>di[z]abituato</i>	'unused'
k.	word/word	boundary	6+	[s]	<i>bu[s] arancione</i>	'orange bus'

(6) *French*

a.	word/word	boundary	+6	[s]	<i>tout</i> [s]eul	'all alone'
b.	clitic/host	boundary	+5	[s]	<i>le</i> [s]ent	'(s/he) feels it'
c.	stem ₁ /stem ₂	boundary	+4	[s]	<i>porte</i> [s]igarettes	'id.'
d.	prefix/stem	boundary	+3	[s]	<i>re</i> [s]onger	'rethink'
e.	stem/der.suffix	boundary	+2	?	—	
f.	stem/infl.suffix	boundary	+1	[z]	<i>Champ</i> [z] <i>Elysées</i>	'id.'
g.	no	boundary	∅	[s/z]	<i>fa</i> [s]ade <i>u</i> [z]ine	'id.' 'workshop'
h.	stem/infl.suffix	boundary	1+	[s/z]	<i>bai</i> [s]ons ⁸ <i>bai</i> [z]ons	'(we) lower' '(we) kiss'
i.	stem/der.suffix	boundary	2+	[s/z]	<i>bai</i> [s]ier <i>bai</i> [z]oter	'bear (of stock exchange)' 'smother with kisses'
j.	prefix/stem	boundary	3+	[z]	<i>dé</i> [z]habitué	'unused'
k.	word/word	boundary	6+	[s/z]	<i>bu</i> [s] orange <i>nou</i> [z] allons	'orange bus' 'we go'

As it appears from the tables, there are some significant differences between Standard Italian and French with respect to the distribution of voicing. But before addressing this problem in its general terms, I would like to stress a few minor points. First, it should be noted that French fills the gap for type (f), which is empty in Italian. Second, a comment is in order with respect to type (k) in French. In fact, French presents some contradictory examples, admittedly not many but sufficiently unequivocal. Consider:

- (7) a. *tous* (cf. *ils sont tou*[s] *arrivés* 'they have all arrived' and *tou*[s] *ensemble* 'all (PL) together'; but cf. *tou*[] *mes amis* 'all (PL) my friends')
- b. *li*[s] (or *ly*[s]) 'lily'
- c. *jadis* 'time ago' (whenever the final consonant is pronounced, it appears as [s])
- d. *plus* (cf. *trois plu*[s] *onze* 'three plus eleven'; but cf. *plu*[] *que beau il est haut* 'rather than beautiful he is tall' and *il est plu*[z] *intelligent que l'autre* 'he is more intelligent than the other')

Obviously, the set of examples in (7) is fairly heterogeneous. As a first approximation, one might be invited to claim that /S/ tends to surface voiceless whenever it is truly part of the root (as in (7b-d)), rather than an inflectional morpheme (as in (6f), cf. also *allon*[z] *enfants!*), or a morpheme retaining an inflectional character despite the lack of full morphotactic compositionality (cf. *nou*[z] *avons* 'we have', *me*[z] *amis* 'my friends'). However, this interpretation

is clearly unwarranted in the case of *tous* (see (7a)), the plural of *tout*, which alternates between zero and [s].⁹

From this point of view, Italian presents a more intelligible picture. Root-final /S/ is always voiceless in Italian, even in Northern varieties, known for their tendency to voice intervocalic /S/.¹⁰ As Peperkamp (1997) correctly observes, words like *bus* 'bus', *bis* 'encore', *CUS* 'an acronym standing for University Sport Centre', *lapis* 'pencil', *Loris* 'a person name', *rebus* 'rebus' do not undergo voicing before voiced consonants (as in (8a)), thus violating the regular word-internal phonological process shown in (8b). Consider:

- (8) a. *lapi[s] blu* (**lapi[z] blu*)
 b. *ri[s]pondere* 'answer', *di[s]cutere* 'discuss', *di[s]tratto* 'absent-minded' vs. *pre[z]bite* 'long-sighted', *di[z]gustare* 'disgust', *tra[z]duttore* 'transducer'

The behaviour of the words as in (8a) in connection with derivational suffixes, like the evaluative ones (admittedly non-prototypically derivational affixes), is however trickier. Kenstowicz (1996) suggests that [s] is preserved even in the speech of Northern Italian subjects, with the effect of preserving the identity of the root-final phoneme; an obviously ecological behaviour, in the sense described above (cf. *lapi[s]ino*, *lapi[s]accio*). Peperkamp (1997), however, rightly points out that Italian speakers show an (inter-subject) variable and (intra-subject) oscillating behaviour. One may in fact also find pronunciations such as:

- (9) a. *lapi[z]ino* 'little pencil' *lapi[z]accio* 'bad pencil'
 b. *lapi[s:]ino* 'little pencil' *lapi[s:]accio* 'bad pencil'¹¹

It should be noted, however, that it is no wonder that Italian subjects hesitate about the use of evaluative suffixes in these cases, since the inherited lexicon — where consonant-final words are virtually absent — does not present examples of this sort. No precise strategy has as yet emerged: and this is quite understandable in the case under analysis, for evaluative suffixes may easily be dispensed with by alternative strategies (cf. *lapisino* = *piccolo lapis* 'little pencil'). Nevertheless, a much more effective argument, not yet discussed in this context as far as I know, is provided by the behaviour of /S/-final words before vowel-initial ones, as in:

- (10) a. *bu[s] azzurro* (*[z]) 'blue bus'
 b. *bi[s] entusiastico* (*[z]) 'enthusiastic encore'
 c. *lapi[s] appuntito* (*[z]) 'sharp pencil'¹²

This is thus good evidence that boundary <6+> corresponds to a condition that tends to be protected, in order to preserve the final edge of the lexical root. The ecological purpose of this strategy should be obvious. Further evidence concerning this is provided by Neapolitan Italian, as suggested to me by Livio

Gaeta.¹³ In this variety, /s/ is palatalised intervocalically before bilabial and velar stops. Yet, when a word boundary follows, this process is disactivated.

- (11) a. *ca*[ʃ]*pita* 'an exclamation (like: wow!)', *ca*[ʃ]*co* 'helmet'
 b. *bu*[s] *puntuale* 'punctual bus', *bi*[s] *caloroso* 'warm encore'

With this in mind, we may try to display — in the style of (4) above — the overall picture of Standard Italian and French with respect to intervocalic /S/-voicing:

(12) *Standard Italian*

boundary to the right				no boundary			boundary to the left			
6+	3+	2+	1+	∅	+1	+2	+3	+4	+5	+6
s	z	s/z	s/z	s/z	?	?	s	s	s	s

(13) *French*

boundary to the right				no boundary			boundary to the left			
6+	3+	2+	1+	∅	+1	+2	+3	+4	+5	+6
s/z	z	s/z	s/z	s/z	z	?	s	s	s	s

A glance at diagrams (12-13) shows that the situation in the two languages considered is very similar. In both cases, there is a strong tendency to protect morpheme-initial /S/ from the effect of the intervocalic voicing rule, which might endanger the perception of the first — and thus crucial — consonant of the lexical root. Yet, there is a difference. The French system is altogether less efficient than the Standard Italian one, for the detection of a [z] sound conveys contradictory information: it may be an inflectional element following a weak boundary (<+1>), but it may also be a morpheme-final (<6+...1+>) or a morpheme-internal consonant (<∅>). Indeed, the only information that French speakers may infer is the negative one, concerning the fact that [s] could not possibly be an inflectional (<+1>) or a prefix-final (<3+>) element.

For Standard Italian speakers the situation appears to be slightly better, in the sense that [z] provides negative evidence in relation to the strongest boundaries. This consonant could not possibly signal the beginning (<+3...+6>) or the end (<6+>) of a lexical root: it thus has to be morpheme-internal (<∅>), or else it must be a prefix-final segment (<3+>) or a root-final segment preceding weak morpheme boundaries (<2+,1+>). The situation improves even further in Northern Italian, where intervocalic /S/-voicing applies in a systematic way within the domain of the word, except root-initially and word-finally. As for root-final /S/, it is in most cases voiced, unless it is also word-final (<6+>); in fact, Italian requires in most cases the presence of derivational and/or inflectional morphemes, which are always vowel-initial. The following diagram shows the situation:

(14) *Northern Italian*

boundary to the right				no boundary			boundary to the left			
6+	3+	2+	1+	∅	+1	+2	+3	+4	+5	+6
s	<u>z</u>	z	z	z	?	?	s	s	s	s

As may be seen, for Northern Italian speakers the picture appears to be fairly clear (despite the qualifications that I shall point out in the next section, concerning boundary <+3>). Here /S/ provides positive evidence for the beginning of a lexical root (<+3...+6>) or the end of a word (<6+>).¹⁴

Actually, there is more than this. A fact that has so far mostly gone unnoticed is the tendency of many Northern Italian speakers to voice /S/ in the prefix *trans-* before vowel-initial roots, as shown in (15a) (as opposed to (15b), where the fricative is the root-initial consonant, due to deletion of the identical prefix-final consonant):¹⁵

- (15) a. *tran*[z]*atlantico* 'transatlantic', *tran*[z]*alpino* 'transalpine',
tran[z]*oceanico* 'transoceanic', *tran*[z]*uranico* 'transuranic',
tran[z]*eunte* 'transient'
- b. *tran*[s]*iberiano* 'trans-Siberian', *Tran*[s]*ilvania* 'trans-Sylvanian',
tran[s]*ustanziazione* 'transubstantiation'

It should be remarked that not all Northern speakers exhibit this behaviour, although it is not clear to me what the exact geography of this phenomenon is. A detailed investigation should be carried out to this purpose. Nevertheless, the problem posed by (15a) is rather intriguing, in that one might suspect that for the speakers presenting this behaviour the rule of /S/-voicing is not simply intervocalic, but rather 'intersonorant', or maybe 'postnasal'.¹⁶ However, a moment's reflection suggests that this is not the case: with the exception of the speakers referred to in fn. 16, the speakers who pronounce [z] in (15a) present [s] in words such as *pen*[s]*are* 'to think', *fal*[s]*o* 'false', *pen*[s]*amento* '(way of) thinking', *fal*[s]*ario* 'counterfeiter' (i.e., before <1+,2+> boundaries). Thus, this process of postnasal /S/-voicing is limited to one precise condition, namely the <3+> boundary. This is the reason why this degree of strength is underlined in (14). This suggests that, after all, the behaviour of these Northern speakers is not totally remote from that of Standard Italian speakers, shown in (12). In fact, in both (12) and (14) the <3+> level plays the role of a turning point: be it the point where Standard Italian speakers shift to [z] instead of allowing the word-internal contrast /s/ ~ /z/, or the point where some Northern Italian speakers adopt the highly peculiar strategy of postnasal /S/-voicing.

2. In defence of morpheme boundaries

One major consequence that can be drawn from the situation depicted in (12-14) is that Loporcaro's plea for the reintroduction of morpheme boundaries as ex-

explicit theoretical tools in phonological analysis seems indeed to be justified. Obviously, the term "reintroduction" is used here with reference to mainstream generative phonology, for I am perfectly aware that quite a number of scholars never actually dismissed the use of boundaries. However, given the pervasivity of the generative model, there is no doubt that the notion 'boundary' has become highly suspect to many contemporary phonologists. The latter view is the one I am opposing here.

Although the details of the strength scales on both sides of the 'Ø boundary' kernel could possibly vary as a consequence of further research, we may already claim, on the basis of the available evidence, that we do need a fine-grained strength hierarchy in order to fully describe the differences observed in the three varieties considered above. Obviously, if it turns out that no language ever exhibits a difference between, say, strength <+4> and <+5>, then these two degrees could be collapsed together. Nevertheless, the data reported above, concerning the single rule of intervocalic /S/-voicing in Romance — admittedly just one among many more rules and language families — leave no doubt as to the phonological relevance of quite a few of the strength degrees indicated in the above diagrams.

This claim is alternative to the direction taken by most current phonological models which adopt the view of Prosodic Phonology, where the theoretical notion 'boundary' has been replaced by the notion 'prosodic domain'. In what follows I would like to show that indeed the latter view cannot but somewhat artificially cope with the observable facts. A fine-grained scale of boundary strength provides us with a better understanding of the situation.

Of special interest, in this connection, is the behaviour of Italian with respect to boundary <+3> as compared to <3+>. This topic has been extensively discussed in the recent phonological literature. Consider the following cases, which present the behaviour of both Standard and Northern Italian speakers:¹⁷

- (16) a. *a[s]ociale* 'asocial', *ri[s]illabare* 'resyllabify', *de[s]acralizzare* 'desacralize'
 b. *anti[s]immetrico* 'antisymmetric', *para[s]intetico* 'parasyntetic',
poli[s]illabo 'polysyllable'
 c. *di[z]illudere* 'disillusion', *tri[z]avolo* 'great-great-grandfather',
bi[z]unto 'greasy', *ci[z]alpino* 'cisalpine', *tra[z]andato* 'shabby'

Since, as noted above, Northern speakers voice intervocalic /S/, it is not a priori obvious that they should keep it voiceless word-internally after a prefix, as in (a-b). Conversely, the obligatory voicing of prefix-final /S/ by Standard Italian speakers before a word-internal boundary, as in (c), should not go unnoticed either, given the phonological value of the feature [voice] in this variety. Loporcario (1995) was the first to reconnect these two facts, a matter previously overlooked in the literature (only concerned with Northern Italian); and the solution proposed by him — based on the different location of the morpheme boundary

in the two cases — seems indeed to be the correct one. Obviously, the fact that the two mentioned varieties share the same behaviour in (16) appears to be perfectly justified in the ecological perspective adopted here. The conflicting values of voicing selected in <+3> vs. <3+> enhance the contrast between morpheme-initial vs. morpheme-final segments, offering the speakers an explicit boundary signal, especially welcome to the language learner. In this way, the task of identifying the left margin of lexical roots is facilitated, and so is, as a consequence, the process of lexical access.

Prosodic Phonology has offered an array of different solutions to this problem. Nespor & Vogel (1986) suggested that in Italian there is a structural difference between the words — as in (16a) — containing a monosyllabic vowel-final prefix and the words — as in (16c) — containing a consonant-final prefix (which can only be monosyllabic). The latter words were considered to constitute a single prosodic word, while the former were regarded as composed by two prosodic words. This is clearly an *ad hoc* solution. An amendment was subsequently proposed by Vogel (1994) who, abandoning the Strict Layer Hypothesis, adopted the idea that monosyllabic prefixes be directly dominated by the node Clitic Group rather than Word. The structure of an Italian word containing a monosyllabic prefix should then be represented as in (17), where W stands for Word and CG stands for Clitic Group:

(17) [pref [root]_w]_{CG}

According to Vogel, the voicing of intervocalic /S/ in Northern Italian depends on syllable structure. It is [-voice] root-initially (as in [s]ole ‘sun’ and a[s]ociale ‘asocial’), and [+voice] syllable-finally (as in di[z]attento ‘inattentive’), provided no voiceless obstruent follows (as in di[s]connettere ‘to disconnect’).¹⁸ Thus, according to this proposal, the direction of the rule should be the reverse of what is generally assumed, namely it should be regarded as an /S/-devoicing rule, rather than an /S/-voicing one. However, the data in (8) and (10) above show that /S/ is virtually always voiceless word-finally, i.e., in a typically syllable-final context (see also fn. 7). Thus, Vogel’s generalisation is not supported by language data.¹⁹ Besides, as Loporcaro (1995) observes, this proposal would not solve the problem anyway, because the very category of Clitic Group is not convincingly justified on empirical grounds in Italian.

The proposal put forth by Kenstowicz (1996), couched in the framework of Optimality Theory and tailored specifically for Northern Italian, is based on the observation that the restriction on voicing in (16a-b) is due to a constraint of “Uniform Exponence”, to the effect that the segmental shape of the base morpheme is preserved in the output. As may be seen, there are similarities between this position and the one adopted here; yet, Kenstowicz’s proposal is empirically inadequate, because it suggests that the reason why a[s]ociale turns out as it does is that the word *sociale* exists as such, and therefore it should be pre-

served in the prefixed item. However, this would lead us to conclude that Northern speakers should say *pre[s]entimento* 'foreboding', given the existence of *sentimento* 'feeling', and this does not seem to be true, because most Northern speakers have *pre[z]entimento*, as Baroni (1997) points out. Furthermore, Kenstowicz's proposal overlooks the fact that both Northern and Standard Italian speakers behave very much in the same way in the cases under consideration. The main appeal of the solution proposed by Loporcaro is precisely that all sides of this problem are for the first time considered together. Obviously, Kenstowicz's view could be enriched in such a way as to incorporate all the observable facts. For instance, a constraint ranking could be introduced, to the effect that Uniformity Exponence protects the beginning of a morpheme (e.g., *[s]ociale*) better than its end (e.g., *di[z]-*). However, this would be equivalent to adopting a strength scale for morpheme boundaries, so no real advantage would be achieved with respect to the solution adopted here.

The most recent proposal — to my knowledge — is Peperkamp's (1995; 1997:74-82). Her first step concerns the structural configuration, which — for words as in (16a) — is assumed to be as follows:

(18) [pref [root]_w]_w

with recursion of the Word node. This makes it possible to maintain the Strict Layering Hypothesis. Second, Peperkamp correctly notes that Italian has a constraint to the effect that no root may begin with *[zV], where 'V' stands for 'vowel'. As a consequence, when a monosyllabic vowel-final prefix is added to an /S/-initial root (as in (16a)), speakers refrain from voicing the fricative. On the other hand, when an /S/-final prefix is followed by a vowel-initial root (as in (16c)), a less than optimal configuration is obtained, for we then have a closed syllable (the prefix) followed by an onsetless one (the first syllable of the root). As a result, resyllabification applies and the internal brackets are erased in order to preserve Strict Layering.²⁰ Thus, whereas *asociale* 'asocial' has the representation shown in (19a), *disattento* 'inattentive' undergoes the transformation shown in (19b):

(19) a. [a [sociale]_w]_w
 b. [dis [attento]_w]_w → [dizattento]_w

Given the structure in (19b), the rule of /S/-voicing should predictably apply in Northern Italian.

This solution is clever, but once again inadequate. First and foremost, it fails to explain why Standard Italian speakers should have voicing in (16c) and (19b), for (as observed above) Standard Italian has no rule of /S/-voicing word-internally. Second, Peperkamp's solution runs against the intuition of the native speakers as far as the structure of words such as *asociale* and *disattento* is concerned. In fact, for any Italian speaker there does not seem to be any difference whatsoever between these two words in terms of semantic transparency. In both

cases, the root is perfectly identifiable, as indeed should be the case with moderately productive prefixes such as *a-* and *dis-*, which could be used to form perfectly transparent neologisms such as *aparitetico* ‘non parithetic’ and *disirritare* ‘to calm down an irritated person’. Ultimately, the brackets’ erasure in (19b), just as the consonant migration in example (i) of fn. 20, are nothing more than theory-internal devices, imposed by Strict Layering. They have no special appeal to scholars immune to the fascination of Prosodic Phonology (and even there, they only have an appeal to scholars adhering to the Strict Layering Hypothesis). Besides, since this device does not solve the empirical problem it was supposed to settle with respect to intervocalic /S/-voicing in Italian — for it leaves unexplained the behaviour of Standard Italian speakers — there is no reason to keep it.

3. On the efficiency of morpheme-protection mechanisms

This is not to say, however, that internal boundaries should never be obliterated. On the contrary, this is a fairly common phenomenon in natural languages, as suggested by the instances where semantic opacity arises, or where currently available morphophonological processes fail to apply. As an illustration of the latter case, consider the following examples from French (Hannahs 1995:13) and Spanish (Harris 1983):

- (20) a. *immoral* ‘immoral’, *innombrable* ‘countless’, *illégal* ‘illegal’,
irréel ‘unreal’
 b. *immaîtrisable* ‘insurmountable’, *innégociable* ‘not negotiable’,
inlavable ‘unwashable’, *inratifiable* ‘unratifiable’.
- (21) a. *inscribir* ‘to enroll’, *substracción* ‘subtraction’,
superstición ‘superstition’, *antistrofa* ‘antistrophe’
 b. *inescrupuloso* ‘without scruples’, *subespecie* ‘subspecies’,
superestrella ‘superstar’, *antiespañol* ‘anti-Spanish’.

Adopting Hannahs’ interpretation, we find here evidence for the different treatment of the same prefixes, to be understood along the lines of the “diachrony/synchrony” divide. The French examples in (20) demonstrate that the Latin phonological process of total regressive assimilation, possibly still active in Old French, ceased to operate in subsequent stages of the language.²¹ Note that the words in (20b) are pronounced with an initial nasal vowel, showing that they undergo the (morpho)phonological constraints of Modern French. In fact, the words in (20a) have been created much earlier, and were probably inherited from Latin, as is also shown by the spelling of the last two words, as contrasted with that of the last two words in (20b). As to spelling, note also that despite the lack of contrast in the first two words of (20a-b), the pronunciation is different. Similarly, the Spanish examples in (21) show that the introduction of a later phonological process did not affect the words already acclimatised in the lan-

guage. The rule of vowel epenthesis before word-initial complex onsets is clearly a Spanish innovation: the words previously imported from Latin do not exhibit this process, although in both cases the morphological operation is the same, namely the insertion of a prefix.

Thus, although the morphotactic transparency of the words in (20a) is perfectly perceivable by contemporary French speakers,²² it may reasonably be assumed that in these cases the internal morpheme boundary has been lost. As a consequence, these words function — from the morphophonological point of view — as indivisible lexical entities. This is even more so with the items in (21a), for in that case the semantic transparency has also been effected, with the result that these words, although morphotactically analysable for cultivated speakers, turn out to be fairly opaque from the semantic point of view.

This brings us to the second type of word-internal boundary obliteration, which is especially relevant for the main topic of this paper. It is in fact the case that the reluctance to intervocalic /S/-voicing in the pronunciation of Northern Italian speakers in the presence of a strength <+3> morphological boundary (see (16a-b)), is actually modulated by the criterion of semantic transparency. This has been evidenced in the very accurate experimental study carried out by Baroni (1997). Note, once again, that semantic transparency should not be confused with morphological compositionality, i.e., morphotactic transparency (or analysability). Native speakers may perfectly understand that *antesignano* contains a prefix, even though they are not able to make sense of the root **signano* (etymologically deriving from Lat. *signa* 'insignia').²³ The most interesting result obtained by Baroni concerns the fact that, indeed quite predictably, the contrast 'transparency/opacity' does not constitute a dichotomic opposition, but rather a very fine-graded continuum. Thus, the fact that a given root-initial /S/ is pronounced as voiceless or voiced becomes a matter of statistical evaluation, with respect to the behaviour of a sufficiently representative group of subjects. And since the loss of semantic transparency is not an abrupt event, it is to be expected that this gradual process be reflected in the increasing proportion of [z]-pronunciations. Note however that the expansion of this behaviour is not entirely linear, and may at times appear somewhat capricious. An inspection of Baroni's materials shows for instance the following:

- (22) a. *Words with prevailing [s]-pronunciation:*
antisettico 'antiseptic', *asincrono* 'asynchronous',
bisessuale 'bisexual', *presalario* 'stipend', *prosecuzione* 'prosecution',
riserva 'reserve', *risiedere* 'to reside', *risolvere* 'to solve',
risorse 'resources'
- b. *Words with prevailing [z]-pronunciation:*
bisestile 'referring to leap-year', *desistere* 'to desist',
desumere 'to deduce', *presagio* 'presage', *presunto* 'presumed',
risultare 'to result'

c. *Words with mixed pronunciation:*

bisettrice 'bisecting (line)', *coseno* 'cosine', *presidente* 'chair-person',
residenziale 'residential', *resipiscenza* 'resipiscence', *risacca* 'surf',
risanare 'to cure'

This list is somewhat surprising in some cases. For instance, in my own Northern pronunciation the following words definitely appear with [s]: *coseno*, *presidente*, *residenziale*, *risacca*, *risanare*, while the following invariably present [z]: *riserva*, *risolvere*, *risorse*. Besides, the prevailing [s]-pronunciation in some instances does not seem to be justified in terms of total semantic transparency, for the root does not exist alone (as with **secuzione*, **siedere*, **sidenziale*). By contrast, in some cases the root does exist, but with a clearly different meaning (as in *sacca* 'bag'), so that the [z]-pronunciation should definitely prevail; or maybe the root exists as such, and yet some speakers have the [z]-pronunciation (as with *sanare*).²⁴

According to Baroni, the words which elicit a mixed pronunciation are characterised by a double representation, with or without internal morphological boundary. However, this interpretation poses several problems. First, it should be noted that the statistically mixed pronunciation of many words analysed by Baroni is also the product of different individual behaviours, which may be fairly consistent in themselves. Thus, if a double representation exists, it could also be regarded as a product of the combined representations of (various sets of) Northern speakers.²⁵ Second (and crucially), although we may agree that the contrast [s]- vs. [z]-pronunciation most naturally corresponds to the contrast compositional vs. non-compositional structure, we should not take this external datum as unerring diagnostics with respect to the cognitive level. Although some degree of convergence may reasonably be assumed, we should not forget that what we observe here is a 'disturbed' system, i.e., a system undergoing a complex transformation. It is thus to be expected that there be occasional deviances from the prevailing tendency, due to the complex interaction of different speakers, each with her/his own idiosyncratic (and not perfectly stable) behaviour. Besides, it is certainly the case that analogy also plays a role here, interfering in some hidden way with the most natural course of events. As a result, at both the individual and the collective level we observe somewhat unpredictable solutions, which cannot be explained away by means of simplified diagnostics. Most probably, what happens is this: people do tend to have a compositional representation with totally transparent items, a unitary representation with totally opaque items, and a mixed situation in the remaining cases; but as to the actual pronunciation of root-initial /S/ after vowel-initial prefixes, this does not exactly mirror the respective cognitive representation, for there may be analogical interferences from words of the alternative class, or interferences from other people's pronunciations. Ultimately, there is little more we can say, apart from the undeniable fact that the most clear instances give rise to alternative and

clearly distinct pronunciations; for the rest, there ought to be fuzzy transitions from the [s]-class to the [z]-class.

Note finally that the blurring of semantic transparency, and the possible obliteration of the internal boundary, may also be observed in the case of a stem₁/stem₂ boundary located at the right of /S/, for which we provided no strength specification in (4) above. Indeed, in the pronunciation of some Southern Italian speakers, *gasdotto* is pronounced with [z], as noted in fn. 7. However, this seems to be the only case of an /S/-final stem₁ in Italian; and I am not in a position to state whether, typologically speaking, such a level should be given an autonomous existence in the overall strength hierarchy.

4. Conclusion

In this paper I have tried to show, following the path traced by Loporcaro, that we need a fine-grained boundary-strength scale in order to capture the different behaviour of the various Romance languages with respect to the rule of intervocalic /S/-voicing. The varying distribution of [s] vs. [z] is indeed modulated by the strength of the morpheme boundary and by its position relative to the fricative segment.

The adoption of this perspective enables us to put forth interesting predictions. We may for instance wonder whether there exist languages where inflectional and derivational morphemes (strength <+1,+2> and <1+,2+>) behave differently with respect to some crucial phonological process; or whether there exist languages which treat differently the boundary 'clitic/host' as compared to the boundary 'stem₁/stem₂' (strength <+4,+5>), and whether these levels of strength should be posited also when the boundary is at the right of the relevant segment. What we do know already, on the basis of this limited amount of evidence, is that, generally speaking, morpheme-initial segments tend to enjoy more protection than morpheme-final ones, and that word margins (both initial and final) enjoy more protection than word-internal segments.

It is important to realise, however, that even in Romance this is only a tendency, not an inviolable constraint. A striking counterexample is indeed offered by most Southern Italian vernaculars, where, according to the interpretation put forth by Fanciullo (1997), word-initial (and prevocalic) [v ð γ] are the lenited cognate of underlying /b d g/. Another interesting counterexample is offered by Central and Northern Corse, where unvoiced initial consonants undergo voicing in intervocalic position, depending on grammatical context (Giacomo-Marcellesi 1997: 9-10):²⁶

- | | | | | |
|------|--------------------|-------------------------|-----------------------|-----------------|
| (23) | <i>trè</i> [p]ani | 'three pieces of bread' | <i>u</i> [b]ani | 'the bread' |
| | <i>in</i> [t]erra | 'on earth' | <i>a</i> [d]erra | 'the earth' |
| | <i>è</i> [k]ara | '(it) is dear' | <i>a vida</i> [g]ara | 'the dear life' |
| | <i>trè</i> [s]alti | 'three jumps' | <i>quatru</i> [z]alti | 'four jumps' |

As may be seen, this process of initial consonant voicing depends on lexical idiosyncrasy (cf. the numerals *trè* vs. *quattru*, or the definite article *u, a* etc. vs. the preposition *à*, cf. *sta à [s]enta* 'listen!'). This is somehow reminiscent of the well known case of Welsh 'mutation', which is also heavily conditioned by morphological and lexical factors (see e.g., Duffield 1997). This may be considered at odds with the general thesis defended in this paper, namely that root-initial phonemes tend by and large to preserve their identity. However, the very fact that the sandhi phenomena observable in Central and Northern Corsica and Welsh are grammatically conditioned suggests that this is not true. For the competent speaker, the nature of the conditioning element provides a hint as to the correct interpretation.

But even assuming, on the basis of the abundant evidence available, that the general tendency is indeed the one suggested here — i.e., that the salient positions are protected from the action of phonological operations that might alter their appearance — there still remains a fundamental problem worth addressing with respect to the cases where (as in the /S/-voicing examples examined in section 1) the activation of a given phonological rule is modulated by a scaling of factors. Namely: what is the actual efficiency of these protecting devices? In section 1, it was observed that the distribution of /S/-voicing in French is less informative than in Standard Italian, and much less so than in Northern Italian. However, the efficiency of this system is far from perfect even in the latter variety. First, this mechanism works one-way only. It merely signals the difference between prefix-final /S/ and root-initial /S/; it does not provide the speaker with the ability to factor out the disturbing presence of falsely-prefixed words, such as *disegno* 'design', *disastro* 'disaster' or *bisogno* 'need', *bisonte* 'bison', whose initial phonemes have nothing to do with the prefixes *dis-* or *bis-* (to be found in *disabile* 'handicapped' or *bisavolo* 'great-grandfather'). Thus, the speaker has in many cases to rely on her/his lexical competence. Second, as we saw in section 3, the exact delimitation between root-initial and non-root-initial /S/ in prefixed words is far from perfect, for we observe a fair amount of variability, mostly along the dimension of semantic transparency. Thus, once again the speaker is left alone with her/his — partly idiosyncratic — lexical competence.

Ultimately, we have to agree that languages may offer some help to their speakers, but by no means provide them with anything even remotely similar to an automatic pilot.

Address of the author

Pier Marco Bertinetto
 Scuola Normale Superiore
 I-56126 Pisa (Italy)
 e-mail: bertinet@sns.it

Notes

- * I would like to thank Marco Baroni and Livio Gaeta as well as two anonymous referees for their very useful comments and suggestions, and Michele Gulina for drawing my attention to the Faliscan data (see example (2)). An implicit thanks obviously goes to Michele Loporcaro, whose work has been the primary input to this research.
- 1 Besides the examples reported here, see also the concluding section below for some further examples concerning this type of violation.
The violability of phonological constraints is one of the fundamental claims of contemporary Optimality Theory. But much before OT entered the scene, this claim was assumed by the 'Naturalistic' school, initiated with the Natural Phonology of David Stampe and further developed by W. U. Dressler. In the various domains to which Natural Linguistics has been applied (not only phonology, but also quite notably morphology, syntax and textual linguistics), it is assumed that there exists a competition between alternative tendencies. The specific direction taken by any language is thus the result of a very complex interaction of factors: typological factors first of all, but also, to some extent, contingent ones. Viewed in this context, the protection of segments' identity at morpheme boundaries is a typical example of the interface between phonology and morphology, where phonology refrains from operating so that higher order factors, such as morpheme detection, may intervene.
- 2 By "vernacular" I mean the local (historically developed) language, which should not be confused with the particular variety of the national language spoken in the same place. The Italian word for vernacular is "dialetto", literally corresponding to English "dialect"; however, the latter word may induce some misunderstanding, for in the English literature it is commonly used to refer to a specific variety of the national language. This would clearly be inappropriate, given the sociolinguistic situation of Italy. All speakers possessing their local vernacular have a clear awareness of its alterity with respect to Italian, be it a Romance vernacular or (as may also be the case) a non-Romance one.
- 3 With capital /S/ I indicate in this paper the dental fricative unspecified for the feature voicing, as in Prague School phonology. Needless to say, this does not imply commitment to underspecification theory.
As far as spelling is concerned, note that both pronunciations of this consonant are transcribed with <s> in the Italian orthography.
- 4 I am grateful to Michele Gulina for drawing my attention to this work.
Another possible candidate for the violation of the tendency to preserve segments' identity at the left boundary of root morphemes is the rule of fricative aspiration (/s/ or /f/ → /h/), to be observed in several languages; cf. Sp. *hierro* 'iron' (< Lat. *ferrum*), *humo* 'smoke' (< Lat. *fumus*). However, Méndez Dosuna (1996) points out that there is no ground for assuming that word-initial segments are the preferred site for the application of this process. In most cases, a careful examination of the data shows that if this change applies word-initially it also applies syllable-finally, i.e., in a site that most naturally lends itself to lenition processes of this sort. As to the specific case of Lat. /f/ → Sp. /h/, the impression that this process applied only word-initially is merely due to a distributional accident. In Latin, /f/ had virtually disappeared from non-initial positions, and survived almost exclusively in late Greek loanwords, where it underwent the effect of voicing before it could undergo that of aspiration (cf. *Stephanu* → *Esteban*). In conclusion, there does not seem to exist a real exception to the principle stating that the root-initial position is a preferred site for fortition, as opposed to lenition processes.
- 5 Example (d) is more complex than the others. As to the presence of <z> in *zenatuo* in contrast to the preservation of <s> in *sententiad*, Bonfante observes that the latter word is preceded by a genitive (*zenatuo(s)*), whose final /s/ is generally preserved, as opposed to the /s/ of the nominative (cf. *Folcoseo* in (a)); thus, with the <s> of *sententiad* the scribe did not perceive a latent intervocalic condition, as he did instead with *de zenatuo*.
The behaviour of Faliscan may appear somewhat extreme, but in fact it is much less extreme than that of Old Latin, where intervocalic /S/ became in most cases /t/, as Loporcaro (1995) points out. See Bonfante (1966) for some interesting documentary information on the matter.

- 6 Loporcaro's view of the boundaries' strength-hierarchy is clearly reminiscent of previous proposals, such as McCawley's (1968) and Basbøll's (1981). Obviously, the ranking proposed here is not intended to be universal; different languages may differently modulate the situation, especially with respect to the word-internal domain. In any case, it seems to be a fact that there is a hierarchy of morpheme boundaries within the phonological word. In section 2, a comparison with recent proposals put forth in the framework of Prosodic Phonology will be made.
- 7 As a matter of fact, there is one such case in Italian: *gasdotto* 'pipe-line'. The situation with this word is interesting. Most speakers have [s], as predicted for a stem-final fricative; but among Southern speakers one may find people with a [z]-pronunciation, thus suggesting that, for them, the internal boundary is somewhat blurred. In addition, it should be noted that some Northern speakers (presumably in the Emilia area) have [z] in *gas* even in isolation. For these speakers, unsurprisingly, voicing is preserved also in the compound. However, this seems to be an isolated case.
- 8 The [s]-pronunciation is often reflected in the spelling: consider *baisser* (as opposed to *baiser*) and *façade*.
- 9 To be exact, *tous* does not contain a fully-fledged plural suffix; rather, it appears to be the plural allomorph of its singular counterpart *tout*. Even better, we could claim that there are two plural allomorphs, one with [s] and the other with zero, depending on the syntactic context; indeed, the impact of syntax is also quite evident in the case of *plus*, according to the examples given in (7d).
As a matter of fact, the uninflected-plural-morpheme interpretation is also justified with *les* 'the-PL', *mes* 'my-PL', *nous* 'we', *vous* 'you-PL', which could hardly be regarded as the 'plural' of *le/la*, *ma/mon*, *je*, and *tu*. This is the reason why they are listed under (6k). The only difference is that, in contrast to *tous*, the fricative-final allomorphs of these words — when selected by the appropriate phonotactic context — always present [z] instead of [s]. Thus, the underlying final dental fricative in French retains the voicing contrast to be observed also in intervocalic position.
- 10 The single possible exception is *gas* in some Northern pronunciations (see fn. 7). But notice that even in this case, derived words show an oscillating behaviour, sometimes even in the pronunciation of one and the same speaker: cf. *ga[z]ato/ga[s:]ato*, possibly (but not necessarily) with semantic specialisation, as in 'enthusiastic (in the derogatory sense)' / 'with gas'.
- 11 This oscillation — reflected in the spelling by the contrast <s> / <ss> — is also to be observed in other derivational contexts, such as the perfective participle *dopato/doppato* (from the English loanword *doping*). However, when the root has been fully acclimatised, only the geminate variant is accepted: cf. *stoppato* (**stopato*) 'stopped', *bissato* (**bisato*) 'done twice, repeated'.
- 12 The same is true for the analogous French examples: cf. *bu[s] orange*. This confirms the observation made in fn. 9, concerning the underlying voicing contrast in final position. It should be noted, though, that according to Loporcaro (1999) some Central Italian speakers may present [z] in these contexts: *Denni[z] Hopper* 'a person name', *Addi[z] Abeba* 'a place name', *il raï[z] egiziano* 'the Aegyptian rais'. Interestingly, however, all these cases involve foreign nouns; and at least the first two cases may be perceived, as it were, as a single word.
- 13 Another case involving root-final consonants, equally showing that the prevailing tendency is to preserve the identity of the phoneme, is provided by Standard Spanish. In this language one may find, root-finally, allomorphs with palatal or non-palatal nasal, as in:
- (i) a. *desdeñar, desdeñan* 'to disdain, (they) disdain'
b. *desden, desdeñes* '(the) disdain, (the) disdains'
- Crucially, in both cases the form of the root is preserved across the whole inflectional paradigm, with an obvious advantage for the language learner. The difference with respect to the cases considered in (8) and (10-11) is that in (i) the root is (in most cases) contained within the word, being usually followed by an inflectional morpheme.
- 14 One referee asks me to state what happens in casual speech, specially with regard to word-word cases. The plain answer is that the contrast formal/casual does not matter in the problem at issue.

- 15 Needless to say, the prefix is the same in both (a) and (b); the only difference concerns the fact that in (b) the prefix-final /S/ is deleted before another dental fricative. This prefix may also appear before other consonants, undergoing the normal process of voicing assimilation: cf. *tran[s]codifica* 'transcoding', *tran[s]frastico* 'transphrastic', *tran[s]tiberino* 'trans-Tiberine' vs. *tran[z]danubiano* 'trans-Danubian', *tran[z]nazionale* 'transnational'. Thus, it behaves on all counts like any other /S/-final prefix in Italian.
- 16 The voicing of the fricative in *trans-* before vowel-initial roots has been noted also by Baroni (1997, fn.5). Interestingly, a circumscribed class of speakers from the Trentino and South Tirol (Alto Adige) area, as well as from Trieste, shows evidence of a postnasal voicing behaviour (Baroni p.c., also verified by the present author with a Trentino speaker from Val Sugana). These people say *ascen[z]ore* 'lift' and *pen[z]ione* 'pension', as opposed to *fal[s]o* 'false' and *per[s]ona* 'person'. Apparently, for these speakers, this type of voicing is phonetically conditioned and does not depend on a particular boundary strength.
- 17 As far as intervocalic /S/-voicing is concerned, no difference whatsoever should be noted between the mono- and the disyllabic prefixes in (16a-b) in terms of prosodic constituency, although there may be reasons to claim that they belong to alternative classes in terms of stress assignment. Nevertheless, since in the literature on /S/-voicing these two classes have been kept artificially separate (often as a consequence of theoretical assumptions relating to the Prosodic Phonology model), I shall do the same here for expository convenience. Note that according to Baroni's statistical findings, mono- and disyllabic prefixes differ with respect to /S/-voicing inclinations, in the sense that the latter induce a largely prevailing [s]-pronunciation, while the former yield a fairly oscillating behaviour. However, this should not be imputed to alternative prosodic constituency; it is instead the by-product of the complex interaction of other, more salient factors. I refer the reader to Baroni's very detailed analysis. Note, in this connection, that the junction prefix-root is in general a very complex phenomenon in Italian, as is also shown by the behaviour of vowel-final prefixes followed by vowel-initial roots, which give rise to a variable pronunciation strategy oscillating between hiatus, diphthongization and deletion (Gili Fivela & Bertinetto, to appear).
- 18 Obviously, by syllable-final position I mean here the position occupied by the fricative in the prefix before it is adjoined to the lexical root. After postlexical resyllabification, the fricative in *disattento* eventually becomes syllable-initial.
- 19 It has been pointed out by one referee that the word-final and the syllable-final position are not the same object; thus, Vogel's suggestion could ultimately be retained. Note however that:
- (i) in normal cases, syllable-final /S/ undergoes voicing assimilation (see (8b)), so that its voicing status is undecidable;
- (ii) as observed in fn. 18, even the prosodic status of prefix-final /S/ is uncertain in Vogel's approach, and if anything, at the stage where voicing is predicted in this approach, it seems to be root-final. I therefore believe there is no ground to defend Vogel's position on the basis of these considerations.
- 20 Actually, this is not the whole story. The erasure of the internal brackets in (19b) is ultimately a consequence of the nested structure postulated for words containing a monosyllabic prefix. In the normal case, when two words follow each other, Peperkamp (1997:27-29) suggests that there is migration of the coda consonant from the first to the second word without brackets' erasure, as in:

(i) [bar]_w [aperto]_w → [ba]_w [raperto]_w 'open bar'

It remains a mystery to me why this solution could not be exploited in the case of:

(ii) [dis [attento]_w]_w → [di [sattento]_w]_w 'absent-minded'

Thus, even assuming Peperkamp's model, I do not see any compelling reason why /S/ should undergo voicing in the latter case. One has the impression that the technical solution adopted is somewhat arbitrarily tailored in such a way as to produce the desired result, with no cogent reason behind it. In order to achieve the right result, as Livio Gaeta has pointed out to me, one would have to introduce a condition on the underlying form: but this is a highly questionable move in the OT framework adopted by Peperkamp.

- 21 Interestingly, Italian behaves in a different way, as shown by Peperkamp (1997:85-86). In this language, the prefix *in-* is nowadays almost completely non-productive; thus, instead of **irraddoppiabile* 'non doubleable', the contemporary speaker would most probably say *non raddoppiabile*. Note that **inraddoppiabile* is independently excluded for phonotactic reasons.
- 22 Actually, in the case of *innombrabile* one should observe that the semantic transparency is not perfect, for this word is not, strictly speaking, the contrary of *nombrabile*.
- 23 Yet, the frequency and productivity of the prefix may have an effect. Thus, for instance, some words beginning with *ri-* tend to present [s] even though they are not transparent.
- 24 Other relevant examples are the following:

- (i) a. *tra[s]udato* 'transuded'
 b. *tra[z]ognato* 'dreamy' (obviously connected with *sognare* 'to dream', but with some degree of semantic modification, as shown by the absence of **trasognare*)

According to Baroni's investigation, *trasudato* regularly yields an [s]-pronunciation, and *trasognato* does so in a very large proportion of instances; however, in my speech the latter word tends to elicit a [z]-pronunciation.

- 25 This statement should be taken with due caution. Baroni pointed out to me (p.c.) that no one of his subjects was absolutely consistent; every one showed a certain degree of oscillation in a number of words. This is indeed my own experience, as a Northern speaker, in quite a number of cases. I thus do not intend to deny that individual behaviours may oscillate; I simply want to suggest that *inter*-individual variation may be an even more relevant factor than *intra*-individual variation.
- 26 Incidentally, the reader should be aware that this book is haunted by an impressive number of misprints; however, the data presented here have been directly checked by the present author.

References

- Baroni, Marco. 1997. The representation of prefixed forms in the Italian lexicon: Evidence from the distribution of intervocalic [s] and [z]. MA thesis. UCLA.
- Basbøll, Hans. 1981. "On the function of boundaries in phonological rules." In: Goyvaerts (ed.), 245-269.
- Benincà, Paola, Alberto Mioni & Laura Vanelli (eds.). 1999. *Fonologia e morfologia dell'italiano e dei dialetti d'Italia*. Atti del 31° Congresso della Società di Linguistica Italiana. Roma: Bulzoni.
- Bonfante, Giuliano. 1966. "Il valore della lettera z in falisco. In margine al libro della dott. G. Giacomelli." *Archivio Glottologico Italiano* 51, 1-25.
- Cole, Ronald A.. 1973. "Listening for mispronunciations: A measure of what we hear during speech." *Perception & Psychophysics* 1, 153-156.
- Cole, Ronald A. & Jola Jakimik. 1978. "Understanding speech: How words are heard." In: Underwood (ed.), 67-116.
- Duffield, Nigel. 1997. "Configuring mutation in Irish." *Canadian Journal of Linguistics* 42, 75-109.
- Durand, Jacques & Bernard Laks (ed.). *Current Trends in Phonology: Models and Methods*. Salford: University of Salford Publications.
- Fanciullo, Franco. 1997. *Raddoppiamento sintattico e ricostruzione linguistica nel Sud italiano*. Pisa: Edizioni ETS.
- Giacomo-Marcellesi, Mathée. 1997. *Corse*. München - Newcastle: Lincom Europa.
- Gili Fivela, Barbara & Pier Marco Bertinetto. To appear. "Sulla sillabazione dei prefissi italiani terminanti in vocale." *Archivio Glottologico Italiano*.
- Goyvaerts, D.L. (ed.). *Phonology in the 1980's*. Ghent: Story-Scientia.
- Hannahs, Stephen J. 1995. *Prosodic Structure and French Morphophonology*. Tübingen: Niemeyer.

- Harris, James W. 1983. *Syllable Structure and Stress in Spanish. A Nonlinear Analysis*. Cambridge, MA: MIT Press.
- Hawkins John A. (ed.). *Explaining Language Universals*. Oxford: Blackwell.
- Hawkins, John A. & Anne Cutler. 1988. "Psycholinguistic factors in morphological asymmetry." In: Hawkins (ed.), 280-317.
- Hurch, Bernhard & Richard A. Rhodes (ed.). *Natural Phonology: The State of the Art*. Berlin – New York: Mouton de Gruyter.
- Kenstowicz, Michael. 1996. "Base-identity and uniform exponence: Alternatives to cyclicity." In: Durand & Laks, 363-393.
- Loporcaro, Michele. 1995. *Prosodic domains in Romance phonology*. Ms.: Romanisches Seminar der Universität Zürich.
- Loporcaro, Michele. 1999. "Teoria fonologica e ricerca empirica sull'italiano e i suoi dialetti." In: Benincà et al., 117-151.
- Mazzola, Michael L. (ed.). *Issues and Theories in Romance Linguistics: Selected Papers from the Linguistic Symposium on Romance Languages XXII*. Washington D.C.: Georgetown University Press.
- McCawley, James D. 1968. *The phonological component of a grammar of Japanese*. The Hague: Mouton.
- Méndez Dosuna, Julián. 1996. "Can weakening processes start in initial position? The case of aspiration of /s/ and /f/." In: Hurch & Rhodes, 97-106.
- Nespor, Marina & Irene Vogel. 1986. *Prosodic phonology*. Dordrecht: Foris.
- Peperkamp, Sharon. 1995. "Prosodic constraints in the derivational morphology of Italian." *Yearbook of Morphology 1994*. Dordrecht: Kluwer, 207-244.
- Peperkamp, Sharon. 1997. *Prosodic Words*. Den Haag: Holland Academic Graphics.
- Underwood, G. (ed.). *Strategies of Information Processing*. Academic Press.
- Vogel, Irene. 1994. "Phonological interfaces in Italian." In: Mazzola, 109-126.