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Laryngeal Relativism predicts Italian

Katalin Balogné Bérces♀ and Bálint Huszthy♂
Pázmány Péter Catholic University, Budapest♀,♂ *and Research Institute for Linguistics, Hungarian Academy of Sciences*♂
♀*berces.katalin@btk.ppke.hu*

Abstract

Two-way laryngeal systems are classified by Laryngeal Realism into [voice] languages (or "**L**-systems", e.g., Slavic, Romance) and [spread glottis] ([sg]; or aspiration) languages (or "**H**-systems", e.g., the typical Germanic pattern). More recently, Cyran (2014) has proposed Laryngeal Relativism (LR), claiming that phonetic interpretation is arbitrary, and as a result, two phonetically identical systems, even two dialects of a language, may turn out to diverge phonologically. His example is Polish: while Warsaw Polish represents the typical [voice]/**L**-system, he analyses phonetically identical Cracow Polish as an **H**-system (counter to Laryngeal Realism's uniform classification of Slavic languages).

However, in the "classical" version of [sg] languages (e.g., English), no laryngeal activity in the form of any kind of spreading is attested, which suggests the absence of any source element and, instead, a dominant role of obstruency (|**h**|). We, therefore, arrive at a three-way typology: **h**-systems, **H**-systems and **L**-systems. At the same time, arbitrary phonetic interpretation in LR predicts the existence of, e.g., **h**-systems with virtually no aspiration in the fortis series. We claim that this is indeed the characterisation of Italian. Using data from potential feature spreading situations, elicited in loanword and foreign accent settings, we show that Italian is an **h**-system, exhibiting no true laryngeal activity.

Keywords: laryngeal phonology; Italian phonology; laryngeal typology; Laryngeal Realism; Laryngeal Relativism

1. Introduction[1]

The present paper aims to show how binary laryngeal obstruent systems (i.e., phonological systems exhibiting a distinction between two sets of obstruents)

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are represented in models based on unary subsegmental primes. Recently, several such models have been proposed: Government Phonology's Element Theory (henceforth ET) may be considered as a forerunner of Laryngeal Realism, which has in turn inspired Laryngeal Relativism. In what follows, we introduce and evaluate these three models, eventually synthesising them into a system that caters for all the previous observations. In addition, we adduce data from Italian to demonstrate that not only does the system cover the well-known facts of the laryngeal phonological literature but novel empirical evidence can also be found to support some of the predictions the system makes.

As it will soon turn out, we claim that the insights of both Laryngeal Realism and Laryngeal Relativism are necessary for a proper account of the full attested two-way laryngeal typology. That is because a fundamental assumption of ours is that apparent *phonetic* similarities or differences do not necessarily imply a *phonological* identity or difference, respectively; that is, languages *categorise* their obstruents in a way more or less independent of their phonetic realisations, but it is this categorisation that determines their phonological behaviour or patterning. In this way the whole paper is couched in a framework subscribing to a central principle of phonological theory that can be traced back to Kaye's Phonological Epistemological Principle ("The only source of phonological knowledge is phonological behaviour", Kaye 2005: 283).

The paper is structured as follows. Section 2 introduces the facts of two-way laryngeal systems as they are conceived under Laryngeal Realism: the distinction between aspiration (or [spread glottis] or [sg]) languages (e.g., (Standard) English or German; Section 2.1) and [voice] languages (e.g., Slavic and Romance languages[2]; Section 2.2) is drawn. Then, in Section 3 we show how ET, the subtheory of melodic representations in Government Phonology, expressed the very same distinction already at the beginning of the 1990s by advocating a typological difference between **H**-systems and **L**-systems – a set of terms revived (and considerably amended) by Cyran's Laryngeal Relativism (Section 4). The present paper contributes to this typological issue by making two proposals. *First*, in Section 5, we affirm what has been tentatively proposed in Balogné Bérces and Huszthy (2017) and Balogné Bérces (2017): since "classical" aspiration languages do not fit into Cyran's typology, three subtypes of binary laryn-

[2] Note that while analyses couched in Laryngeal Realism typically treat both Slavic and Romance as laryngeally uniform, Cyran attacks this view for the former (at least for Polish), and we attack it for the latter (provided that the traditional classification is maintained for Romance languages other than Italian).

geal systems should be assumed (besides **L**-systems and **H**-systems, unmarked systems, or **h**-systems, should also be posited). *Second*, in Section 6, contra its traditional classification as an **L**-system solely based on impressionistic evidence of its surface phonetics and on its supposed genetic inheritance as a Romance language, Italian is shown to exhibit the characteristics of **h**-systems. We use data from potential feature spreading situations, elicited in loanword and foreign accent settings, to demonstrate that even in cases when the disturbing factor of the rigorous phonotactics of its native vocabulary is excluded, Italian will refuse to display true laryngeal activity – very much like English or German. Finally, Section 7 concludes.

Before we set off, a few disclaimers are in order. Throughout the paper, we only focus on binary systems (but we believe that three- and four-way systems can be accounted for in a similar vein); moreover, we only concentrate on binary distinctions that can be phonetically related to voice onset time (VOT) (i.e., distinctions of voicing and aspiration/spread glottis) – the discussion of systems based on constricted glottis are beyond our present scope.

2. Two-way laryngeal systems

Languages differ as to how many series of obstruents they distinguish by some laryngeal specification, such as voicing, (post)aspiration (spread glottis – henceforth [sg]), glottalisation (constricted glottis – henceforth [cst gl]). Since in languages with a single series that one series is voiceless unaspirated unglottalised (e.g., Finnish, Hawaiian, Maori), it is generally accepted that these specifications present the unmarked setting for laryngeal features.[3] The unmarkedness of tenuis is supported by its ability to undergo passive voicing (see Section 2.1) in these unary systems as well as its presence in all other, more complex systems, whether it is in opposition with one, two or three additional series, deriving languages with two, three or four sets of obstruents, respectively. Out of these, the present discussion focusses on the first two of the attested two-way contrasts, enumerated and exemplified in chart (1) (inspired by Iverson and Salmons 1995: 383 and 2003: 45, cf. Huber and Balogné Bérces 2010).

[3] As pointed out by a reviewer, Maddieson (1984: 108) reports that Maidu has aspirates, ejectives, and implosives, but no plain voiceless plosives. In fact, Maidu may not be the only example, but since we subscribe to the Phonological Epistemological Principle, we cannot evaluate such phonetic facts without a proper examination of the phonological system. That is, however, beyond the scope of the present discussion.

(1) Two-way laryngeal contrasts in obstruents

Examples	**p ~ b̥**	**b**	**pʰ**	**p'**
English, German, Welsh, Mandarin Chinese	[ ]		[sg]	
French, Spanish, Russian, Hungarian	[ ]	[voice]		
K'ekchi (Q'eqchi'), Mam	[ ]			[cst gl]

In more complex laryngeal systems [voice], [sg] and [cst gl] combine in various ways, e.g., [voice]-cum-[sg] is realised as a voiced aspirate (/bʰ/) as in Hindi. The only phonetically-motivated gap is the inability of [sg] to combine with [cst gl], for obvious anatomical reasons.[4] Otherwise, on the basis of Iverson and Salmon's chart Huber and Balogné Bérces (2010) conclude that (i) in the vast majority of the cases the complex articulations (e.g., voiced aspirate) imply the presence of their simplex components (e.g., the voiced series and the aspirated series in this case), and (ii) "all complex systems (three or more contrasts) seem to employ at least one VOT distinction" (Iverson and Salmons 1995: 382), i.e., either [voice] or [sg].

Therefore, the basic distinctions seem to be those of voicing and aspiration/spread glottis. In the rest of the paper, we focus on binary phonological systems making use of these, i.e., the English-type and French/Hungarian-type languages of chart (1). According to the traditional Generative Phonological view, these two types only differ on the surface, due to the differing phonetic manifestations of an underlying, uniform voiceless vs. voiced distinction. However, in the present paper we subscribe to a more recent tradition that has become known as "the narrow interpretation of [voice]" or "laryngeal realism" (cf. Honeybone 2005; Iverson and Salmons 2008). The claim is that a distinction must be drawn between languages in which the contrast is based on vocal cord activity, i.e., voicing in the strict sense (the so-called voice languages), and languages in which the obstruents traditionally analysed as voiced vs. voiceless actually contrast in negative or zero vs. positive VOT – recall the classical lenis vs. fortis distinction (the so-called aspiration (or [spread glottis], or [sg]) languages). This is because the apparently *phonetic* difference between these two language types is of *phonological* relevance as it has serious consequences for the patterning of the whole system of obstruents.

[4] A reviewer notes, quite correctly, that this suggests that [sg] and [cst gl] are not two features, but two manifestations of a single binary feature.

The *phonological* distinction between aspiration languages and voice languages, as argued in Huber and Balogné Bérces (2010 and elsewhere), rests on the observation that the two language types represent two totally different phonological mechanisms. While in voice languages the [voice] feature is phonologically active, which generates assimilation processes, in aspiration languages no signs of any laryngeal activity are detectable. Compare, for instance, the fortis-lenis sequence in English *ma<u>tchb</u>ox* [-tʃb̥-], having obstruents identical in phonetic realisation to the ones appearing in the citation forms of *ma<u>tch</u>* [-tʃ] and *<u>b</u>ox* [b̥-], with its Hungarian pronunciation as a loan, *ma<u>tchb</u>ox* [-dʒb-] 'small toy car', exhibiting obligatory and complete Regressive Voicing Assimilation (henceforth RVA). Echoing Kaye's Phonological Epistemological Principle mentioned above, we can assert that the presence / absence of phonological behaviour (in our case, RVA) implies the presence / absence of the representation of some phonological agent (in our case, some laryngeal prime).[5] Accordingly, voice languages like Hungarian are claimed to be marked for [voice], whereas aspiration languages like English show no evidence of a laryngeal melodic component. We provide more details below.

2.1. Aspiration languages

Heavily drawing on Huber and Balogné Bérces (2010), we claim that in aspiration languages like typical Germanic (English, German, etc. – with the crucial exception of Scots, Dutch, Yiddish and Afrikaans) the notion *voice* is not relevant at all as it is totally inactive. As a major piece of evidence, these systems do not exhibit the assimilation of voice in the expected form (i.e., RVA – cf. voice languages in Section 2.2 below);[6] instead, they show what is traditionally described as "bidirectional devoicing", illustrated by data from English.

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[5] Cyran (2017) debates this interpretation of the Phonological Epistemological Principle, and advocates a non-spread analysis of RVA.

[6] There are two phenomena which are sometimes taken to be cases of voice assimilation or voicelessness spreading in Germanic (especially in the description of English). One is the devoicing of sonorant consonants after aspirated plosives (e.g., *play* [pl̥-]). In this paper, we regard it as a side-effect of the phonetic manifestation of aspiration/fortisness in strong prosodic positions (and as such, it is found after all fortis consonants, cf. e.g., *smack* [sm̥-], but not when they are in weak prosodic positions as in *at<u>l</u>as*). The other debatable phenomenon is the fortis-lenis alternation of certain suffixes, as in the case of English -(*e*)*s* and -*ed* (e.g., *begs* /-z/ and *begged* /-d/ but *picks* /-s/ and *picked* /-t/). Even if this is alternation at all, its directionality is morphologically driven (stem → suffix), which excludes it from the circle of post-lexical voice assimilation and makes it a case

(2) "Bidirectional devoicing" in (standard) English

"regressive"	"progressive"
roadshow [-d̥ʃ-]	*baseball* [-sb̥-]
bigfoot [-gf-]	*matchbox* [-tʃb̥-]
egghead [-gh-]	*lifeguard* [-fg-]
cheesecake [-z̥k-]	*Shoot back!* [-tb̥-]

Notice, though, that upon the assumption that the basic contrast in these languages is between devoiced lenis (laryngeally unmarked) and aspirated fortis (specified for [sg]), the data clearly show that the (dynamic) devoicing analysis cannot be justified: in fact, in examples like *cheesecake* and *matchbox* nothing happens, simply the underlying form of the obstruents surfaces in the phonetic realisations.

Similarly, what is traditionally described as "initial and final devoicing" of lenis obstruents in English cannot be maintained as a dynamic process – again, nothing happens, simply the underlying form surfaces in the phonetic realisations, cf (3).[7]

The only occasion on which something *does* seem to happen to the laryngeal properties of lenis obstruents is when they undergo intersonorant voicing in examples like *bigger* or *big name*. In Laryngeal Realism, this is traditionally interpreted as passive voicing, that is, as the influence of the spontaneous phonetic voicing of the flanking sonorants. However, as it is but an effect of surface phonetic interpretation, it lies outside the scope of phonology. We conclude that aspiration languages provide no evidence of laryngeal activity, and as a consequence, no evidence of a laryngeal prime in the make-up of obstruent melody.[8]

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of allomorphy. All the more so since all varieties of English exhibit it in the same way irrespective of the laryngeal system the variety belongs to: standard English (an aspiration language) as well as, e.g., Scots (a voice language) – already noted in Iverson and Salmons (1999). However, in (at least standard) English it can even be analysed as a mere phonetic effect, as the absence of passive voicing of the lenis forms ([z̥] and [d̥]) in fortis contexts (cf. Cyran 2014: 6.1; Szigetvári to appear/2019).

[7] Certain aspiration languages have word-final "devoicing" (e.g., German), which involves the lenis obstruents turning into their fortis counterparts (acquiring aspiration even), that is, it is understood as a fortisisation process, and as such, a kind of fortition (cf., e.g., Iverson and Salmons 2007). Its exact workings are, however, not clear, and need further investigation.

[8] In Section 5.1 below, we follow Huber and Balogné Bérces (2010) in claiming that in aspiration languages the fortis and lenis sets differ in structural aspects (namely, fortisness/aspiration is dominant obstruency (h) dependent on licensing, i.e., on prosodic position). There is a growing body

(3) "Initial and final devoicing" of lenis obstruents in (standard) English

utterance-initial	utterance-final
Bravo! [b̥-]	*Mad!* [-d̥]
Good! [g̥-]	*Go ahead!* [-d̥]
Zany! [z̥-]	*Think big!* [-g̥]
Damn! [d̥-]	*Bob!* [-b̥]
Very much! [v̥-]	*Leave!* [-v̥]

2.2. Voice languages

As opposed to aspiration languages, in languages we call voice systems (e.g., most Slavic languages, Hungarian, etc.) what is regularly attested is obligatory and complete RVA, i.e., a strong constraint on obstruent sequences to agree in voicing, both lexically and as a result of a dynamic process of assimilation, in such a way that the final obstruent in the sequence dictates the voicing value. The following Hungarian data illustrate the point at hand; we have also included some of the examples of (2) above to illustrate how English loans are adapted.

(4) Regressive Voice Assimilation in Hungarian

devoicing	voicing
roadshow (Hun.) [ˈroːtʃoː][9]	*baseball* (Hun.) [ˈbɛːzboːl]
rab [rɒb] – *rabtól* [ˈrɒptoːl]	*matchbox* (Hun.) [ˈmɛd͡ʒboks]
'prisoner – from prisoner'	'small toy car'
réz [reːz] – *rézkarc* [ˈreːskɒr͡ts]	*tök* [tøk] – *tökből* [ˈtøgbøːl]
'copper – copper etching'	'pumpkin – from pumpkin'
hang [hɒŋg] – *hangfal* [ˈhɒŋkfɒl]	*kert* [kɛrt] – *kertben* [ˈkɛrdbɛn]
'sound – loudspeaker'	'garden – in garden'
ég [eːg] – *éghez* [ˈeːkhɛz]	*boksz* [boks] – *bokszbajnok*
'sky – to sky'	[ˈbogzbɒjnok]
	'boxing – boxing champion'

of evidence that [spread glottis] is more structural in nature and "more configurationally driven than [voice], which is melodic" (the conclusion in Balogné Bérces and Huber 2010b) – cf. the similar but more recent conclusions of Kaye and Pöchtrager (2017).

[9] The sequence of /t/ and /ʃ/ straddling a morpheme boundary may optionally undergo affrication, producing a geminate [t͡ʃ].

As it is generally assumed, in phonological systems like the one exemplified in (4), the final member in obstruent sequences occupies a strong prosodic position (syllable onset), whereas the consonant(s) preceding it are prosodically weak (syllable-final, or any theoretical interpretation thereof – coda, pre-empty nucleus, etc.).[10] As a result, the melodic prime responsible for voice will spread right-to-left, emanating from the strong consonant and docking onto the weak one(s), resulting in RVA. Therefore we conclude that voice languages require the representation of an active phonological agent in the form of a laryngeal prime.

3. "Laryngeal realism" in Element Theory

Laryngeal Realism is not the first theoretical framework to bifurcate phonological systems into two laryngeal subclasses – Element Theory, the subtheory of melodic representations in Government Phonology, has in fact long made such a distinction.[11] Harris (1994), for instance, claims that in languages like Romance (the voice languages) the element **L** (for low tone in vowels and active voice in obstruents) is active in the lenis series and the fortis set is unmarked; while in languages like English or German (the aspiration languages) the element **H** (for high tone in vowels and voicelessness or aspiration in obstruents) marks fortis, and lenis is unmarked. This is summarised in (5).

(5) Two types of languages in ET (based on Harris 1994: 135)

	Element	English	French
Voiced	**L**	–	*beau* 'beautiful'
Neutral	–	*bay*	*peau* 'skin'
Voiceless aspirated	**H**	*pay*	–

[10] A complete analysis of voice assimilation in various types of consonant clusters in voice languages is beyond our present scope – we understand that the circumscription above may be somewhat oversimplified, since voice assimilation systems very often exhibit additional complexities like spreading in word-final obstruent clusters, occasional (e.g., word-final) sonorant obstruentisation accompanied by (not necessarily regressive) devoicing, obstruents historically evolving from sonorants behaving as sonorants synchronically, sonorant transparency, etc. These are issues we do not aim to address here.

[11] To put it rather informally with some reference to contemporary social media culture, "ET did Laryngeal Realism before it was cool".

ET has since undergone major revisions, most of which should not concern us here (for variation in ET, see Backley 2012). As far as distinctive voice goes, certain recent versions of ET have replaced **L** with **N** (originally only for nasality – cf. Nasukawa 2005), but since the relevant laryngeal literature has not adopted this modification, we will ignore it in the rest of this paper. However, the proposal we do accept departs from the conclusion drawn in Section 2.1, namely, that aspiration languages provide no evidence of laryngeal activity, i.e., no evidence of a laryngeal prime. This is in sharp contrast to what happens in voice languages. Therefore, we identify two completely different mechanisms, which require special representations, but these cannot simply be two elements corresponding to each. This is the argumentation of Huber and Balogné Bérces (2010), who are led to conclude that while voice in voice languages is melodic, aspiration in aspiration languages is a general property of fortis consonants, that is, it is coextensive with fortisness, and they propose that aspiration is dominant obstruency. It follows, then, that aspiration/[spread glottis] has to be represented by the element **h** dominating the phonological expression, that is, in the role of head. The details of their analysis are irrelevant here, but the claim that the laryngeal properties of aspiration languages are not melodically represented and instead, they translate as the special function of **h**, will be heavily utilised in Section 5.1.

4. Laryngeal Relativism

More recently, Cyran (2012, 2014, 2017) has proposed what he refers to as Laryngeal Relativism, i.e., the idea that as long as a sufficient phonetic distance is kept between the two sets of obstruents to maintain phonological contrast ("sufficient discriminability in production and perception"), both the marked and the unmarked sets may receive any (more or less arbitrary) phonetic interpretation. That is, phonetic interpretation is partly systemic (phonological). He also claims that it may even be the case that two laryngeal systems which are phonetically identical stem from two phonological settings in which the marked / unmarked relation is reversed. His example is Polish, whose two major dialect groups, Warsaw Polish (WP) and Cracow Polish (CP), differ phonologically but are phonetically identical in terms of laryngeal features. Namely, while Warsaw Polish represents the "classical" voice system (analysed as an "**L**-system" by Cyran), the phonetically identical system of Cracow Polish is an "**H**-system", with phonologically active **H** rather than **L**.

(6) Warsaw Polish (WP) and Cracow Polish (CP) cross-word assimilations (Cyran 2012: 154)

		WP	*CP*	
a.	*brak oceny* 'lack of mark'	[k ɔ]	[g ɔ]	__ V
b.	*brak jasności* 'lack of clarity'	[k j]	[g j]	__ C^{son}
c.	*brak wody* 'lack of water'	[g v]	[g v]	__ C^{+voice}
d.	*brak pieczątki* 'lack of stamp'	[k p]	[k p]	__ C^{-voice}
e.	*obraz anioła* 'picture of angel'	[s a]	[z a]	__ V
f.	*obraz mistrza* 'picture of master'	[s m]	[z m]	__ C^{son}
g.	*obraz burzy* 'picture of storm'	[z b]	[z b]	__ C^{+voice}
h.	*obraz człowieka* 'picture of man'	[s ʧ]	[s ʧ]	__ C^{-voice}

As can be seen above, both dialects exhibit voice assimilation interpreted here as **L**-spreading in WP and as **H**-spreading in CP. The crucial difference between the two is that CP has what seems to be cases of "cross-word pre-sonorant voicing", which, Cyran claims, is due to its being an **H**-system with unmarked lenis obstruents that undergo passive voicing in sonorant contexts. He, then, arrives at a typology in which WP, Slavic and Romance (as well as, supposedly, Hungarian) are **L**-systems with evidence of phonologically active **L**; whereas CP (as well as, in his view, Germanic languages) are **H**-systems with phonologically represented **H**. What is of crucial significance to us is the fact that he re-defines the category of **H**-systems, "originally" (that is, in Harrisian ET) corresponding to Germanic-type aspiration languages. In his system, languages like CP have active **H** that spreads. While he is able to convincingly treat laryngeal systems with apparent "cross-word pre-sonorant voicing" in an elegant way, he fails to explain why in their "classical" version, e.g., in (standard) English and German, no laryngeal activity in the form of any kind of spreading is attested, which, as we argue above, rather suggests the absence of any laryngeal element. If aspiration/fortisness in "true" aspiration languages is the special function of **h**, as accepted above, then we are able to identify three, rather than two, types of phonological systems: in addition to Cyran's **L**- and **H**-systems, we also assume the existence of what we henceforth refer to as **h**-systems.

5. The theoretical proposal: three subtypes of binary laryngeal systems

We argue above that while Cyran is able to account for laryngeal processes in both voice languages (**L**-systems) and systems with apparent "cross-word pre-

sonorant voicing" (his **H**-systems), his typology needs to be amended to include the category of **h**-systems comprising languages with the pattern described in Section 2.1. Therefore we repeat here what has been proposed in Balogné Bérces and Huszthy (2017) and Balogné Bérces (2017): there appear to exist three subtypes of binary laryngeal systems according to whether they are characterised by (a) the absence of a source element; (b) **L** in the marked series of obstruents; (c) **H** in the marked series of obstruents.

5.1. The absence of a source element: h-systems

This is the phonological representation for (true) aspiration languages like English and German. In such languages, the fortis and lenis sets differ in structural aspects (namely, fortisness/aspiration is dominant obstruency (**h**) dependent on licensing, i.e., on prosodic position – following Huber and Balogné Bérces 2010). As shown in Section 2.1 above, in such systems there is no laryngeal spreading: what seems to be "bidirectional devoicing" (i.e., a combination of "devoicing RVA" and "Progressive Devoicing") results from the false assumption that the lenis set is underlyingly voiced. The view adopted in Laryngeal Realism, that the lenis series is underlyingly unmarked/tenuis, accounts for all these apparent cases of devoicing as well as the intersonorant voicedness of lenis obstruents, conceived as the result of passive voicing.

In addition, as Cyran's Laryngeal Relativism identifies sufficient discriminability in production and perception as a major driving force in the phonetic implementation of phonological contrasts, it predicts the existence of languages in which voice is not phonologically active and is only utilised as the phonetic manifestation of melodically unmarked lenis. In such languages *phonetically* the lenis series is voiced, while the fortis series is (heavily) aspirated, whereby the phonetic distance between the two sets is larger than in, say, English, but this is only to enhance discriminability to a degree beyond the minimally required "sufficient". At the same time, however, these languages will exhibit no laryngeal spreading owing to the absence of a source element in their melodic structure – i.e., *phonologically* the lenis series is voiceless (and, crucially in these systems, unaspirated).

This line of thought applies to Swedish, and explains its long-time riddle. Swedish exemplifies the typical Germanic pattern except for the fact that its lenis obstruents are fully voiced even in initial position, which has led research-

ers to classify it as a separate category (see, e.g., Ringen and Helgason 2004), cf. the examples in (7).

(7) Swedish initial plosives (Ringen and Helgason 2004: 59)

[pʰ]acka 'pack'	[tʰ]ak 'roof'	[kʰ]ub 'cube'
[b]ad 'bath'	[d]äck 'deck'	[g]ap 'mouth'

This is what Balogné Bérces and Huber (2010a) dub "the [voice] fallacy of [sg] languages", which now receives a coherent treatment in Cyran's model: Swedish simply "overshoots" the phonetic distance required for discriminability[12], but phonologically it remains an **h**-system. Swedish is indeed a normal effect of Laryngeal Relativism.

5.2. L in the marked series of obstruents

This is the phonological representation, in harmony with Cyran, of (true) voice languages/**L**-systems like Warsaw Polish, other Slavic languages in general, Romance languages like French, or (Standard) Hungarian. As shown in Section 2.2 above, these languages are characterised by RVA due to the phonological activity of **L**. However, they lack passive voicing (since the voicing of an unmarked, tenuis fortis obstruent would lead to its subminimal phonetic distance, i.e., insufficient discriminability, from its **L**-marked lenis counterpart) – as a result, even if they also have word-final delaryngealisation (as many of the Slavic languages do), they will not exhibit "cross-word pre-sonorant voicing".

5.3. H in the marked series of obstruents

This is the phonological representation of Cyran's **H**-systems, that is, languages like Cracow Polish, with **H**-spreading only (cf. Section 4). Recall that phonetic interpretation is assumed to be arbitrary, and the presence of **H** does not in itself guarantee the presence of aspiration; at the same time, **H** is a prime that is able to spread; therefore **H**-languages, unlike **h**-languages, will exhibit assimilation. In harmony with Cyran, it is assumed, too, that if such languages also have final

[12] As Cyran (2017: 502) puts it, Swedish "goes for maximal dispersion rather than for sufficient phonetic distance".

obstruent delaryngealisation, they also exhibit cross-word passive voicing manifested in "cross-word pre-sonorant voicing". A powerful prediction the model makes is that all systems that have such "cross-word pre-sonorant voicing" (i.e., not only the famous case of "Cracow voicing" in CP analysed by Cyran, but also the other examples that have been identified – Slovak, Catalan, Southern Dutch/West Flemish, Ecuadorian Spanish, even Sanskrit as well as certain varieties of Breton and Hungarian) are **H**-systems (or laryngeal systems more complex than binary, having the features of **H**-systems as one of the components).

If final obstruent delaryngealisation does not take place in an **H**-system, a "simple" devoicing assimilation system with word-internal and cross-word passive voicing of the lenis series is found. As proposed in Balogné Bérces (2017), this is the characterisation of, e.g., North-of-England English varieties displaying what has been dubbed "Yorkshire assimilation" (Wells 1982: 366–367). As illustrated in (8), in such varieties the fortis-lenis contrast is maintained in word-final, pre-sonorant and pre-lenis positions, but it is neutralised (in the **H**-marked fortis set) in pre-fortis environments.

(8) Yorkshire assimilation (Wells 1982: 366–367, data adapted from Honeybone 2011)

ja<u>zz</u>	[-z̥]	*pa<u>ss</u>*	[-s]
ja<u>zz</u> <u>m</u>usic	[-z̥m-]	*pa<u>ss</u> <u>M</u>olly*	[-sm-]
ja<u>zz</u> <u>b</u>and	[-z̥b̥-]	*pa<u>ss</u> <u>B</u>arry*	[-sb̥-]
ja<u>zz</u> <u>d</u>ance	[-z̥d̥-]	*pa<u>ss</u> <u>D</u>ave*	[-sd̥-]
ja<u>zz</u> <u>c</u>lub	[-sk^{h}-]	*pa<u>ss</u> <u>K</u>eith*	[-sk^{h}-]
ja<u>zz</u> <u>p</u>ub	[-sp^{h}-]	*pa<u>ss</u> <u>P</u>ete*	[-sp^{h}-]

The devoicing assimilation system illustrated in (8) differs from (most) other varieties of English[13] in exhibiting complete, categorical devoicing in examples like *jazz pub* (whose relevant cross-word sequence is [-sp^{h}-] in Yorkshire English but [-z̥p^{h}-] in other varieties). It differs from **L**-systems in not exhibiting assimilation in *pass Barry* or *pass Dave* (which would be [-zb-] and [-zd-], resp., if pronounced with, say, a Hungarian accent), whereas it differs from CP in not exhibiting final delaryngealisation (i.e., *jazz* has [z̥] rather than [s]), which in CP leads to apparent "assimilation" in examples equivalent to *pass Barry* as

[13] Scots/Scottish English is best analysed as an **L**-system, cf. Wells (1982: 409–412) and Iverson and Salmons (1999: 22–23).

well as "cross-word pre-sonorant voicing" (which would produce [z] in *pass Molly*).

It needs to be noted that without final delaryngealisation of any type, **H**-systems and **L**-systems are predicted to only differ in whether the fortis or the lenis set is marked – i.e., whether the obstruents which are capable of spreading their prime are closer in their phonetic interpretation to the heavily aspirated end of a VOT continuum and farther from its fully voiced end (cf. Yorkshire *jazz pub* [-sp^{h}-]), or vice versa (cf. hypothetical *pass Barry* [-zb-]). That is, differentiating between **H** and **L** may not be more than an analytic tool to signal the phonetic interpretation of a single phonological object, which reduces the generative power of the analysis.[14] For instance, **L**-languages where **L**-obstruents are voiceless and **L**-less obstruents are aspirated (hypothesised by one of the reviewers in his/her comments) are equivalent to **H**-languages where **H**-obstruents are voiceless and **H**-less obstruents are aspirated – the reverse of the Yorkshire pattern, or the equivalent of an **L**-system that is shifted phonetically from VOT lead vs. short lag to short lag vs. long lag. We are not sure if such a system is attested, but it is predicted to allow the unmarked set to undergo "RVA" (surfacing as its deaspiration) but possibly no passive voicing (to ensure that phonetic distance along the continuum is maintained).

Still, whatever its phonetic manifestation, a fundamental property of the laryngeal prime assumed here remains that it can and will spread – in the absence of spreading (i.e., in the absence of positive evidence), the Phonological Epistemological Principle prevents us from positing a prime at all. This is a strong assumption, as remarked by one of the reviewers, since it lays the burden of phonological computation on the representation. However, this move is not totally alien to either autosegmentalist traditions or more recent representation-based frameworks like Government Phonology; moreover, ours is an interpretation of the Principle that endows the analysis with a kind of minimalist economy. In addition, the non-existence of an inactive laryngeal prime implies that a system which is binary but exhibits no RVA will necessarily be an **h**-system, with the fortis set stably located near the aspirated end of the VOT continuum, and the lenis set fundamentally voiceless but subject to passive voicing. This is exactly what we show in Section 5.1 above, and this is exactly what we also find in Italian, to which we turn now.

[14] For a very similar argumentation, see Cyran (2017).

6. The case study: (varieties of) Italian[15]

In Section 5 above we made our first proposal: since "classical" aspiration languages do not fit into Cyran's typology, three subtypes of binary laryngeal systems should be assumed under Laryngeal Relativism. In this section, we provide a new piece of evidence for this version of LR enhanced with the three-way typology: with its minimal requirement on phonetic interpretation, sufficient discriminability, it does not only predict the existence of languages like Swedish (cf. (7) above) but further combinations of phonological structure and phonetic implementation, too, e.g., **h**-systems with virtually no aspiration in the fortis series. We claim that this is indeed the laryngeal characterisation of Italian.

Italian is generally classified in Laryngeal Realism as an "ordinary" voice/**L**-language. This is primarily based on two arguments. *First*, (impressionistic) evidence of its phonetics, with fully voiced lenis and tenuis fortis obstruents, suggests that it belongs to the same type as, for instance, French, Spanish or (typical) Slavic languages. *Second*, it is supposed to have carried its laryngeal properties throughout its history as part of its genetic inheritance as a Romance language (which is believed to hold for most present-day descendants of Latin even in this paper, cf. our reference in Section 5.2 to "Romance languages like French"). Neither of the two arguments is strong enough to be decisive. The first argument is non-evidence in phonology according to both Kaye's Phonological Epistemological Principle (cited in Section 1) and Laryngeal Relativism; the second argument is easily refuted by the above examples of Polish or English, whose varieties, albeit having descended from a common ancestor, today diverge in their laryngeal settings.

To be able to decide where Italian really belongs (or, in fact, whether it can be categorised at all), we need evidence of its laryngeal patterning. However, this approach is made inert and impotent by the rigorous phonotactics of its present-day native vocabulary: laryngeal activity proper cannot be detected in present-day Italian due to the absence of obstruent clusters (other than /sC/, which seems to present a special case requiring separate treatment – consequently, in what follows we ignore the problems it presents, and refer the reader

[15] Defining Italian is always a problem in synchronic linguistics. Modern Italian is actually a written language, the spoken varieties of which do not share a unified, standard norm (cf. Krämer 2009: 22). Below we focus on these normless spoken varieties of the grammatically and lexically standardised, literary variety called Standard Italian, which we will henceforth simply refer to as Italian.

for data as well as discussion to Huszthy in prep.). Therefore, a novel strategy of gaining empirical evidence is needed. This is what Huszthy (in prep.) discovers: it provides the careful acoustic analysis of data from potential feature spreading situations, elicited in loanword and foreign accent settings, in which speakers of Italian are "forced" to come up with possible pronunciations of input obstruent clusters. The findings of the study are twofold: from a *phonetic* point of view, it finds substantial voicing in lenis obstruents and voicelessness in the fortis set; *phonologically*, however, it fails to identify true laryngeal activity as no assimilation (i.e., feature spreading) is detected in the vast majority of the informants' output. In our present system, this suggests that Italian is an **h**-language, making phonetic use of the sufficient discriminability between fully voiced and voiceless unaspirated.

In the rest of this section, we provide a more detailed discussion of the Italian data we base our claims on, as well as a step-by-step explanation of how we interpret them and how our conclusions ensue.[16]

The data come from the two corpora used in Huszthy (in prep.)'s study. The first corpus was compiled for the purposes of foreign accent analysis, via fieldwork carried out in three cities of Italy (Gorizia, Florence and Naples) with 68 informants. It contains cca. 20 hours of voice recordings of sample sentences in four foreign languages (English, French, German and Spanish). The second corpus is the output of a loanword experiment, comprising recordings made in soundproof studios with 15 Italian informants (from Veneto, Trentino, Emilia-Romagna, Lombardy, Tuscany, Lazio, Campania, Apulia, Calabria and Sardinia). The experiment focussed on consonant clusters, and included 19 sample passages with 93 target words repeated by the informants 5 times. The table in (9) provides examples of target words and prevalent pronunciations.

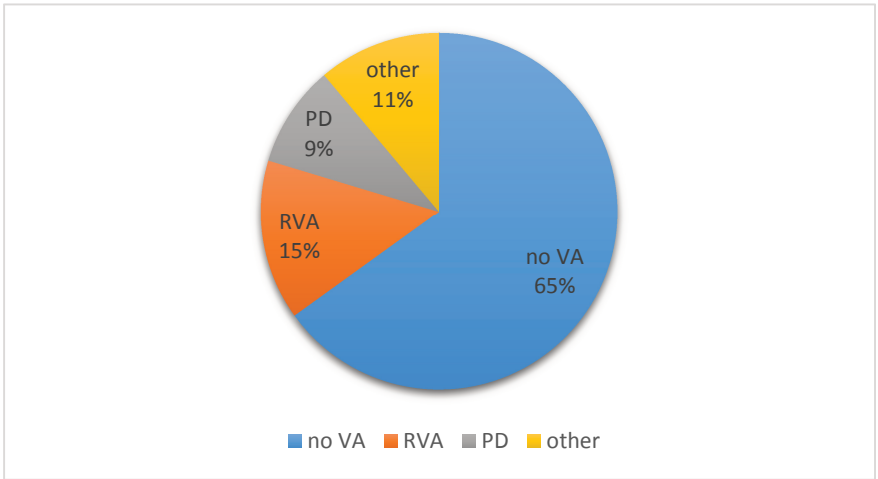
The informants used various repair strategies (RVA, Progressive Devoicing (PD), deletion of one of the consonants, gemination, schwa insertion) as well as the option of no repair strategy at all. In this last case, henceforth referred to as "no VA" (for "no Voice Assimilation"), the two obstruents surface in the input forms (suggested by spelling), immediately following each other with differing voice values and without an intervening release phase or schwa. The diagram in (10) shows the distribution of the strategies used in all the 1685 occurrences of non-/sC/ obstruent clusters in the corpus.

[16] For an Optimality Theoretic analysis of the same data, see Huszthy (in prep.).

(9) Target loanwords and their Italian pronunciations (D = voiced input plosive; T = voiceless input plosive; F = voiceless input fricative; V = voiced input fricative; D͡Z = voiced input affricate)

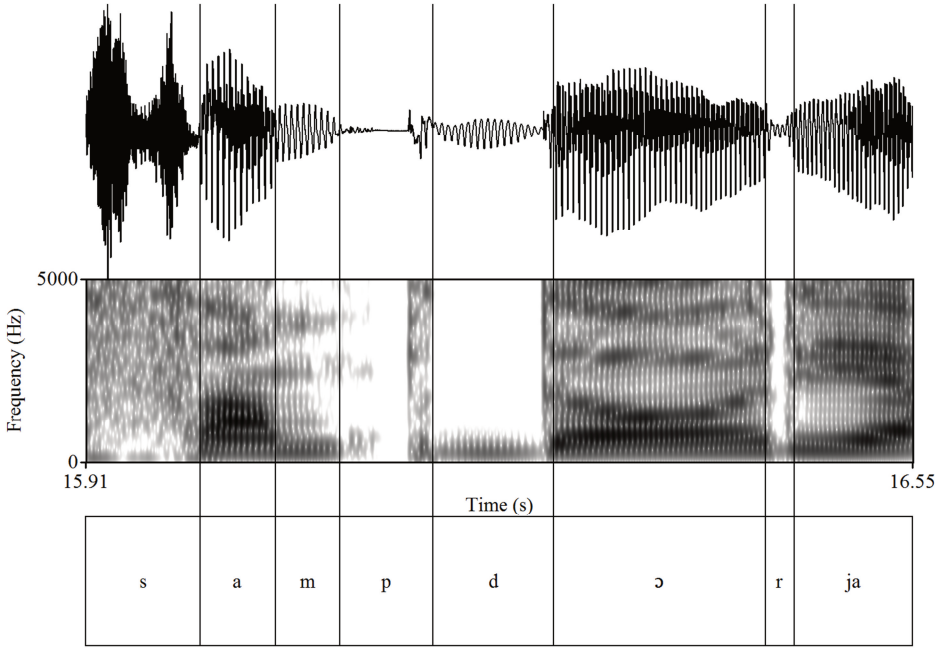
Cluster	Target word	Prevalent Italian pronunciation
DT	*sudcoreano*	[sud(ː)koreˈaːno]
	vodka	[ˈvɔːd(ə)ka]
	subcultura	[sub(ː)kulˈtuːɾa]
	pingpong	[ˈpiŋg(ə)poŋgə]
TD	*upgrade*	[ap(ːə)ˈgrejdə]
	McDonald's	[mekˈdɔːnald(s)]
	Sampdoria	[sampˈdɔːrja]
	football	[ˈfutboll(ə)]
DF, FD, VT	*gangster*	[ˈga(ː)ŋgster]
	afgana	[af(ː)ˈgaːna]
	sovchoz	[ˈsɔːvkots]
	abside	[ˈaːbside]
TD͡Z	*eczema*	[ek(ː)ˈdzɛːma]

(10) Overall statistics of non-/sC/ obstruent clusters

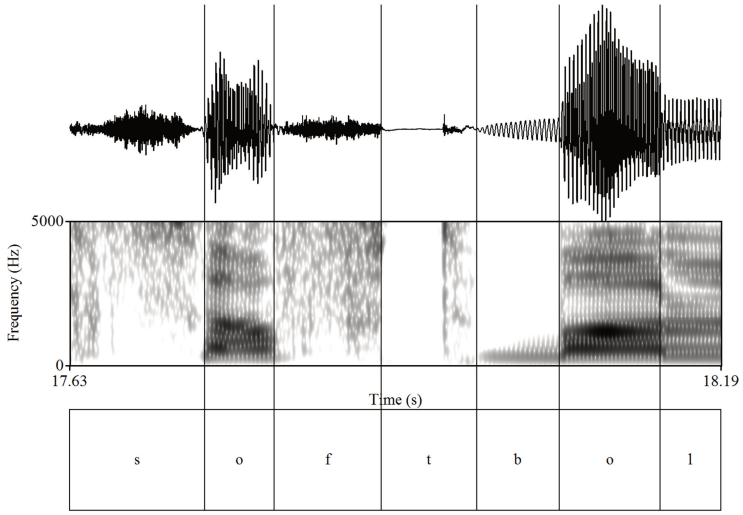


As is clear from the diagram, the most common strategy is the preservation of the underlying voice values: in 1098 cases no assimilation of any kind happens, which is 65% of the total occurrences. This two-thirds majority characterises the performance of all the informants rather evenly – there is no considerable difference between "repairers" and "non-repairers". The only slight variation is found in terms of geographical region: speakers coming from the south of Italy avoid VA somewhat more systematically, but even the informants from northern and central regions all leave more than 50% of the clusters unrepaired. This indicates that voice assimilation is not an integral part of the phonological system of varieties of Italian. In (11)–(13) sample spectrograms illustrate the "no VA" option.

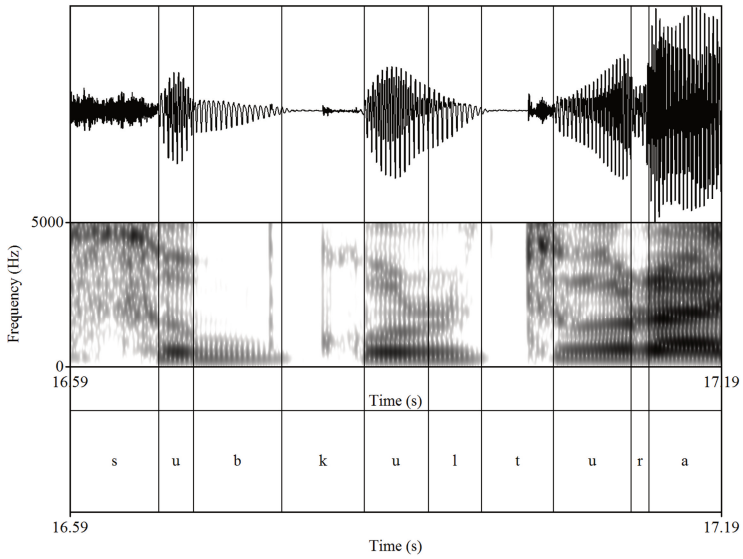
(11) The sequence [pd] pronounced in *Sampdoria*



(12) The sequence [tb] pronounced in *softball*

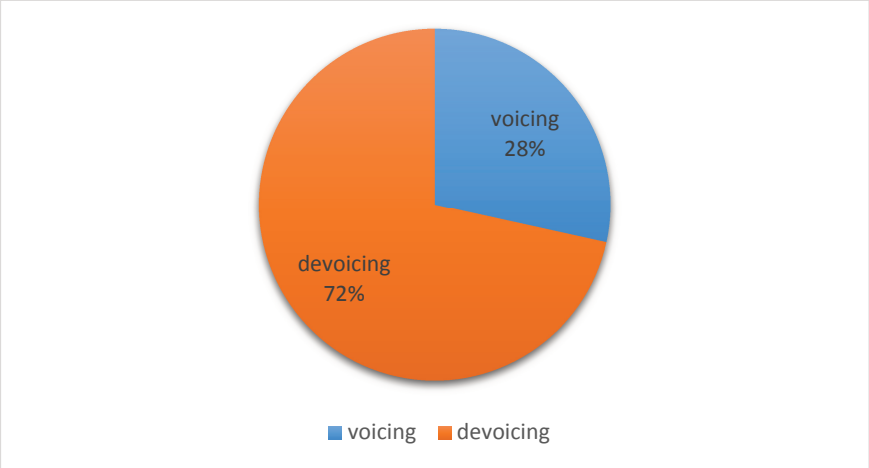


(13) The sequence [bk] pronounced in *subcultura*



The diagram in (10) above shows 15% RVA in the data, which is not insignificant. RVA seems a real, but suboptimal strategy for Italians to resolve these clusters (in fact, every speaker uses it in some measure). However, if we zoom into this phenomenon, it seems rather unbalanced as far as its result as voicing vs. devoicing is concerned: among the 246 occurrences of RVA, 70 cases of voicing (28%) and 176 cases of devoicing (72%) are found, as represented in (14).

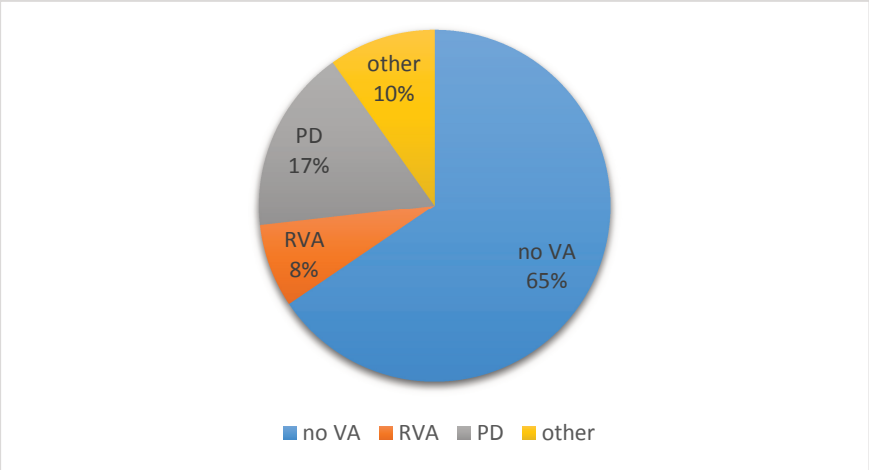
(14) Voicing-devoicing ratio in cases of RVA



Note that the ratio of *potential* voicing and devoicing situations is balanced in the corpus, therefore this clear majority of devoicing over voicing can be interpreted as indicative that RVA has a straighforward tendency to produce voiceless outputs and to be blocked otherwise.

As far as PD is concerned, the diagram in (10) above shows that it applies in 9% of all non-/sC/ input clusters. Although it seems the least used strategy in the overall examination of the data, we must notice that it is highly restricted in its occurrence, being relevant in the TD environment only, i.e., when the voiceless input obstruent precedes the underlyingly voiced one. To avoid the distorting effect of this restriction, the diagram in (15) below only considers the relevant target words, whose pronunciation potentially allows for the appearance of this strategy.

(15) PD in the relevant target words only, compared to the other strategies



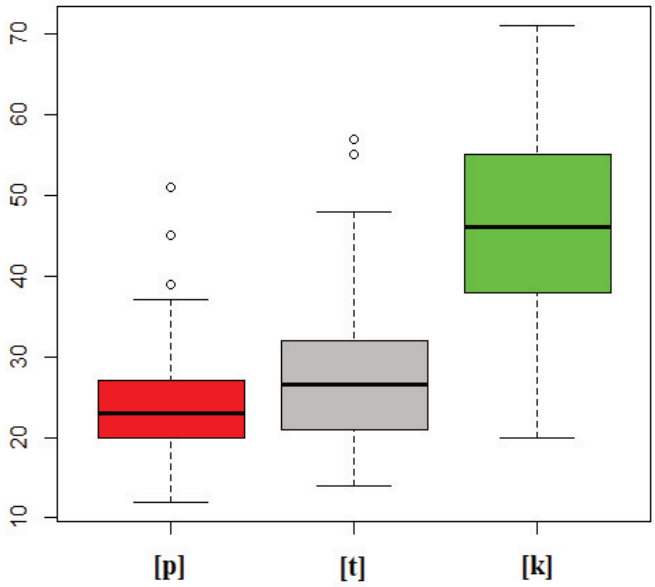
If we take a look only at the target words which allow for the strategy of PD (i.e., words with voiceless plosive + voiced plosive, voiceless non-sibilant fricative + voiced plosive, and voiceless plosive + voiced affricate sequences in the input), we can see it in inverse ratio to RVA. In total, 914 such obstruent clusters are pronounced by the informants, in which 155 cases of PD (17%) and only 70 cases of RVA (8%) occur, while in 599 instances no processes are attested (cf. no VA in 65% of the relevant data). Consequently, if speakers have the choice between the two processes (namely, PD and RVA in the TD context), they clearly prefer PD to RVA.

To sum up the findings of the study, we state that even though Italian exhibits substantial voicing in its lenis obstruents, while its fortis set is basically voiceless unaspirated (see below for the amount of aspiration, though), it does not resort to systematic RVA as a repair strategy in loanwords and foreign accent as is usual in voice languages. Instead, the vast majority of input obstruent clusters remains unrepaired, as also evidenced by the spectrograms in (11)–(13) above. Even in the cases when apparently some process applies, it produces voiceless outputs, be it devoicing RVA or PD.

Notice, however, that this characterisation is reminiscent of what we describe in Section 2.1 above as the profile of (true) aspiration languages, or, as renamed in Section 5.1, **h**-systems. If approached on the basis of their spelling, they exhibit "bidirectional devoicing" (rather than RVA); phonologically, how-

ever, they are better analysed as having voiceless unaspirated lenis and voiceless aspirated fortis underlyingly, with no true laryngeal activity. The "devoicing processes" they appear to display are not processes at all, since the voiceless forms are not derived but underlying. Italian seems to match this description. In fact, the study also confirms that lenis voicedness in Italian is firmly maintained in sonorant environments only, and it is frequently "lost" (in our interpretation, it fails to be gained) next to a fortis obstruent (manifested in apparent cases of "devoicing RVA" and "PD"). That is, it is passive voicing – unexpected from an **L**-language but a regular feature of **h**-systems. The only considerable difference between Italian and, e.g., English, is the phonetic implementation of these obstruents; the absence of aspiration in Italian in particular. The boxplot in (16) shows the VOT values of the initial and medial voiceless plosives in three target words (*pingpong*, *tuttavia* 'however', *chirurgico* 'surgical') pronounced by 15 informants (a total of 258 occurrences). Word position had no significant effect on the degree of aspiration. The total means are the following: /p/ – 24.04651 ms; /t/ – 27.46512 ms; /k/ – 46.12346.

(16) VOT values of /p t k/ (ms)



As can be seen above, the fortis set shows a degree of overall aspiration that falls between the standard values of "ordinary" **L**-systems like Slavic/Hungarian and **h**-systems like (standard) English. However, the values themselves are of little (if any) interest – recall that sheer phonetic realisation is a non-argument in phonology. Italian, usually considered an ordinary Romance language (and as such, an **L**-system) has several peculiarities; nevertheless, we claim, it can be analysed as an **h**-language, which explains these peculiarities. In addition, it seems to be an **h**-system with virtually no aspiration in the fortis series – an option actually *predicted* by Laryngeal Relativism.

7. Conclusion

In this paper, we hope to have been able to show that both Laryngeal Realism and Laryngeal Relativism are necessary for a proper account of the full attested typology of binary laryngeal obstruent systems. While Laryngeal Realism highlights the very existence of a *typology* (as opposed to the phonological uniformity of languages, traditionally assumed since SPE), Laryngeal Relativism clarifies the relation between phonological system and phonetic realisation ("sufficient discriminability in production and perception") and explains how two different systems may receive identical phonetic interpretation. To this the present paper adds the insight of Huber and Balogné Bérces (2010) concerning representations in aspiration languages, and makes the proposal that three (rather than just two) subtypes of binary laryngeal systems should be assumed: **L**-systems vs. **H**-systems vs. unmarked systems (**h**-systems).

The other proposal the present paper makes rests on the observation that Laryngeal Relativism also predicts the existence of, e.g., **h**-systems with virtually no aspiration in the fortis series. We claim that this is indeed the laryngeal characterisation of Italian, a Romance language which is, based sheerly on its genealogy and phonetics, generally considered as an **L**-language. Using data from potential feature spreading situations, elicited in loanword and foreign accent settings, we show that Italian is an **h**-system, exhibiting no true laryngeal activity. The voicing present in the lenis set is fundamentally passive voicing, maintained in sonorant environments and frequently lost next to a fortis obstruent. Although our careful acoustic analysis has detected a degree of overall aspiration in the fortis series that falls between the standard values of "ordinary" **L**-systems and **h**-systems, we contend that primary evidence is to be sought in

phonological behaviour, which is arbitrarily related to phonetic realisation – in Italian very much like in the Cracow dialect of Polish.

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Corresponding author:
Katalin Balogné Bérces
Institute of English and American Studies
Pázmány Péter Catholic University
2–4 Tárogató út
1021 Budapest
Hungary
berces.katalin@btk.ppke.hu