

Arguments against the heterosyllabicity of /sC/ clusters in Italian phonology

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Abstract: In the phonology of Italian it is undecided whether /sC/ clusters are parsed as heterosyllabic or tautosyllabic. I claim that /sC/ is phonetically acceptable both as onset and as parsed into different syllables, but from a phonological point of view it is better to handle it in Italian as a tautosyllabic cluster. My paper is based on the analysis of 68 Italian speakers' foreign accent, who speak English, German, French and Spanish, and the data are analysed in classical Optimality Theory. My arguments concern, on the one hand, the pronunciation of ill-formed consonant clusters by Italian informants, with special regard to the repair strategies they apply; on the other hand the functioning (or rather malfunctioning) of regressive voicing assimilation in Italian.

Keywords: Italian phonology; /sC/ clusters; tautosyllabicity; coda condition; regressive voicing assimilation

1. Introduction

The issue of preconsonantal /s/ is a much-debated topic in linguistics, mostly in the phonology of Latin and Italian. The syllable structure of /sC/ clusters is not clearly identified, owing to the unstability of /s/, which sometimes seems to prefer a syllable-final position (in this case /s/ and the following consonant belong to different syllables, so they are *heterosyllabic*), at other times it seems to appear at the beginning of the syllable (in this case /s/ and the following consonant belong to the same syllable, that is, they are *tautosyllabic*). Consequently, the syllabic status of preconsonantal /s/ is not straightforward in Italian phonology, certain phonologists argue for the universal heterosyllabicity of /sC/ clusters (such as Kaye 1992; Morelli 1999; Krämer 2009; etc.); however, phonetic evidence occasionally interferes with this hypothesis (such as Bertinetto 1999, 2004; etc.). My aim is to share phonological evidence as well, for taking slightly the shine out of the common opinion in phonology, which requires that /sC/ clusters be universally heterosyllabic.

1.1 Methodology: Foreign accent analysis

In this paper I intend to raise three phonological arguments in favour of the tautosyllabicity of /sC/ clusters in the synchronic phonology of Italian. My argumentation is based on the foreign accent of Italian speakers: 68 Italian informants were interviewed in three cities of Italy (Gorizia in the North-East, Florence in the Centre of the Italian peninsula and Naples in the South), who were asked to read different sample phrases formulated in English, German, Spanish and French, choosing the foreign language they were more familiar with. The dataset contains approximately 12 hours of speech recordings.

The analysis of foreign accent is a recent experimental method in phonology: the aim is to measure the productivity of synchronic phonological processes in L1. Foreign accent is a product of phonetic and phonological interference between L1 and L2, which is unavoidable at 100%, and this way it can reveal synchronic phonetic and phonological characteristics of the speakers' mother tongue.

The foreign accent of Italian speakers appears to be useful as far as the syllabic status of /sC/ clusters is concerned. Obstruent clusters are particularly rare in native Italian vocabulary: excluding /sC/ clusters they occur only in cultisms (e.g. latinisms), loanwords and proper names. However, foreign accent offers a way to observe the spontaneous behaviour of obstruent clusters in the pronunciation of Italian informants. There are also different experimental methods to find out about the productivity of phonological phenomena, such as loanword adaptation or the reading out of nonsense words. Nevertheless, foreign accent seems to bypass some weaknesses of these other strategies: on the one hand, it helps to avoid the domain of lexicalisation, which weakens the efficiency of loanword experiments; on the other hand, foreign language speech creates a more authentic linguistic milieu than nonce-word reading, given that the source of the data is a natural language.

The data will be analysed in the framework of classical Optimality Theory, also used by Krämer (2009) in *The Phonology of Italian*. I use Optimality Theory because I aim to demonstrate that many times both a heterosyllabic and a tautosyllabic realisation of /sC/ can be optimal choice on the part of Italian speakers.

1.2 The status of /sC/ in the past and at present

From the point of view of historical linguistics it is undeniable that /sC/ clusters were heterosyllabic in Italian, historical linguists usually highlight four facts to verify it: the blocking of open syllable diphthongisation (e.g. *pie-de* 'foot' vs. *pes-te* 'plague', etc.); the word-initial *i*-prosthesis in Old Italian (e.g. *in is-cuola* 'in school', *in Is-pagna* 'in Spain', etc.); the replacement of the definite article *il* with *lo* (e.g. *il conto* 'the bill' vs. *lo s-conto* 'the discount', etc.); and finally the lack of *raddoppiamento sintattico*¹ before /sC/ clusters (cf. Bertinetto–Loporcaro 2005; Krämer 2009; etc.). However, the phonological productivity of these processes is thoroughly queryable in synchrony, because they are fully or partly lexicalised in Italian phonology.² Bertinetto and Loporcaro (2005) propose as a possible solution that the syllabification of /sC/ clusters is undetermined in contemporary Italian. My proposal will be similar, I would like to claim with the aid of OT that the optimal syllabification of /sC/ clusters can be tautosyllabic as well, and at the surface level vacillation is possible and probable.

A comparable vacillation is also traceable in the phonology of Latin (Cser 2012): in Classical Roman poetry, the scansion of hexameter lines clears that the resyllabification of "extrasyllabic" /s/ was not phonologically determined, and the combination of a vowel and an /sC/ cluster could result in both long and short syllables (for detailed examples see Cser 2012).

¹ Lengthening of word-initial consonants by phono-syntactic patterns in Central and Southern Italian, e.g. *a* [pp] *alermo* 'in Palermo' vs. *a* [s] *poleta* 'in Spoleto', etc.

² The processes of spontaneous diphthongisation in open syllables and vowel-prosthesis have been closed (moreover, the less marked vowel is not /i/ anymore in Italian phonetics, but schwa); definite article selection has been lexicalised as a conscious rule, and *raddoppiamento sintattico* has been in part lexicalised (there are no new productive triggers of the phenomenon any longer, e.g. in Italian foreign accent *raddoppiamento sintattico* is totally absent).

In the following part of the paper I am going to present three different patterns which stem from the foreign accent of Italian speakers, and all show a connection with the synchronic phonological status of /sC/ clusters. My arguments will concern the Italian pronunciation of ill-formed and well-formed but non attested consonant clusters, and finally, the behaviour of regressive voicing assimilation in Italian foreign accent, the deficiency of which is a phonological argument for the tautosyllabicity of /sC/.

2. The well-formed but inexistent fricative plus consonant clusters

As my first argument against the heterosyllabicity of /sC/ clusters in Italian phonology, I appeal to the Italian accented pronunciation of fricative plus consonant clusters (henceforth for these clusters I will use the FC abbreviation, where F stands for all fricatives and C for all consonants). The only FC clusters in native Italian vocabulary are /sC/ clusters, but other combinations of a fricative and a consonant also seems to be well-formed in Italian phonotactics, since the informants did not apply any repair strategies during the pronunciation of FC clusters in L2 (e.g. [ft, çt, xt]). So FC clusters, apart from /sC/, are acceptable in Italian phonology, even if they are not attested in the native lexicon.

The phonetic length of a stressed vowel before an FC cluster is a clear clue to the syllabic structure. It is a widely accepted fact that a stressed syllable in Italian has to be heavy, but its size cannot exceed two moras (Muljačić 1969; Vogel 1982; Nespor 1993; Schmid 1999; Bertinetto–Loporcaro 2005; Krämer 2009). This means that the syllable rhyme cannot contain a long vowel and a coda-consonant at the same time, namely FC clusters cannot be heterosyllabic, if they appear after a long vowel.

As for the /sC/ clusters, Bertinetto (2004) claims that in the synchronic phonology of Italian both long and short stressed vowels occur before /sC/ clusters, e.g. the (It.) word *pasta* has two well-formed pronunciations: [ˈpas.ta] and [ˈpaː.sta], including intraspeaker variations. This observation is confirmed by the corpus of my study: stressed vowel-length is vacillating before /sC/ clusters in Italian foreign accent as well, but it seems regular in the case of other FC clusters, consider the examples in Chart (1).

(1)	target words	→ Italian accented
a.	(Eng.) <i>after</i>	[ˈaːf.tɐr]
b.	(Eng.) <i>prosper</i>	% [ˈprɔːs.pɛr]
c.	(Ger.) <i>Nacht</i> ‘night’	[ˈnaːxtʰ]
d.	(Ger.) <i>Geschichten</i> ‘stories’	[gɛˈʃiːç.tɛn]
e.	(Ger.) <i>gedacht</i> ‘thought’	[gɛˈdaːxtə]
f.	(Sp.) <i>busco</i> ‘to search, S1’	% [ˈbuːsko]

According to the examples of Chart (1), the vowel before FC clusters is regularly lengthened in Italian foreign accent if it carries main stress, and it can be lengthened before /sC/ clusters (vacillation is indicated by the percent sign). Conversely, if the vowel before FC is unstressed (or it carries only a secondary stress³), it remains short, e.g. the word in (1a) was pronounced as [after] in unstressed positions. Example (1c) illuminates better this situation: the target word derives from the German Christmas song “Stille Nacht, heilige Nacht...”. This sample passage contains the target word two times, and the second time it appears at the end of the verse, so it definitely carries main stress.

³ Secondary stress does not imply the heavy syllable requirement in Italian (cf. Krämer 2009).

In fact, the informants who read this passage, generally lengthened the stressed vowel at the second occurrence, while at the first one the vowel remained short, influenced by the lack of stress or by a secondary stress: [ˌnaxt].⁴

Italian foreign accent proves that the optimal syllabic distribution of FC clusters is tautosyllabic in Italian phonology, even if /sC/ clusters may vacillate. Since /sC/ is a subset of FC clusters, the optimal syllabification of /sC/ is supposed to be tautosyllabic as well. The situation is represented in an initial OT-analysis in tableau 1.

/naxt/	MAX-IO	NON-FINAL	FOOT=μμ	PARSE-σ	CODA CONDITION	DEP-IO
a. ('naxt)		*!	*		**	
b. ('nax).tV				*	*!	*
c. ☞ ('na:).xtV				*		**
d. ('na:x).tV			*!	*	*	**
e. nax.tV				**	*!	*
f. ☞ na.xtV				**		*

Tableau 1. OT analysis of the Italian accented pronunciation of *Nacht* ‘night’

In tableau 1 I analyse the Italian accented optimal (or the more potential) pronunciation of the German word *Nacht* ‘night’. Candidates *a–d* are realisations assigned with main stress, while *e* and *f* are unstressed. Brackets indicate the domain of the foot, and the capital V stands for any vowel which can be resyllabified at the right edge of the word (inside a sentence), or it stands for a schwa as an intrusive vowel in final position.

The high ranking of the MAX-IO constraint (“no deletion of any segment from the input”) means that Italian accent is extremely conservative, that is, it is characterised by a solid defense of the input segments (in this manner every candidate with deletion or assimilation – e.g. [nat] – would be eliminated up front). Contrariwise, the other main faithfulness constraint DEP-IO (“no insertion of any new segment in the output”) is low ranked, and this fact allows epenthetic processes (such as schwa-epenthesis and vowel-lengthening) in Italian foreign accent. The three stress-related markedness constraints: NONFINAL (“the final syllable takes no part of the foot”), FOOT=μμ (“the weight of the foot is exactly two moras”) and PARSE-σ (“every syllable is part of a foot”) were used formerly by Krämer (2009), and they concern the phonological effects of the main stress in Italian. In this analysis they prohibit every kind of pronunciation which ends in consonant (like NONFINAL in candidate *a*); as well as the occurrence of stressed syllables which do not reach or exceed the weight of two moras (e.g. FOOT=μμ in an output form like [(‘na).xtV] and in candidates *a* and *d*); moreover, they punish the occurrence of syllables which are not footed (e.g. an output like [(‘na:).xə.tV] would be eliminated by PARSE-σ, because it would violate the constraint three times).

The addition of the CODA CONDITION to the set of the constraints is justified by the fact that Italians normally lengthen the stressed vowel before an FC cluster. This constraint absorbs the three obligations related to the phonotactics of the Italian coda (it will be completed in section 4): a coda consonant in Italian can be only a sonorant (e.g. /l, r, n, m, j/ like in *man-to* ‘mantle’), or part of a geminate (e.g. *mat-to* ‘crazy’) or

⁴ The usual pronunciation was [ʃtile ˌnaxt aʒlige ˈna:xtʰ]; (the sentence was pronounced the same way also by a bilingual German-Italian speaker of Bolzano, probably by Italian interference).

according to Krämer (2009) the /s/ phoneme. Hence, the stressed vowel lengthening can be expressed here by the introduction of the Italian coda condition as a complex constraint. As a result, we can see that the optimal syllabification of the FC cluster in tableau 1 is tautosyllabic, in both stressed and unstressed positions: in the former case by the lengthening of the stressed vowel, in the latter by the CODACOND constraint, which eliminates candidates *b* and *e*, because of the singleton obstruents in coda.

If we considered the target word *b* of Chart 1 (*prosper*) as the input form of the OT-analysis, we would see an interesting development: the winning candidate would be [(ˈprɔs).per], which does not violate the coda condition, unlike [(ˈnax).tV]; and the other attested output form – the vacillating variant: [(ˈprɔ:).sper] – would fall out of the analysis, because it violates the DEP-IO constraint. A way for solve this problem is for instance to not consider /s/ as a possible subject of the Italian coda condition; but in this case the other vacillating form, the former winning candidate would be eliminated by reason of the CODACOND constraint (in the following part I will return to handle the problem of the /s/ in the coda condition). Another possible answer may be the specification of the DEP-IO as a subconstraint: if the dependence between input and output were dissolved inside the domain of the foot (only by the increase of available elements, e.g. stressed vowel lengthening does not violate the constraint), there would be two optimal candidates: [(ˈprɔs).per] and [(ˈprɔ:).sper], and the vacillation is expressed as the speaker’s spontaneous choice between the two optimal candidates.

In conclusion of this part of the paper, my proposal is that FC clusters are fundamentally tautosyllabic in Italian phonology, by reason of the long stressed vowels which usually anticipate them in Italian foreign accent. Furthermore, stressed vowel lengthening is also typical for a few loanwords in Italian which contain an FC cluster, e.g. *grivna* [ˈgri:vna] ‘hryvnia’, *sovhoz* [ˈsɔ:vkoʦ] ‘sovkhoz’, *nafta* [ˈna:fta] ‘naphta’, etc. I claim that /sC/ is a subset of FC clusters, and even if /s/ vacillates, its optimal syllabification before consonant is tautosyllabic as well. In the following part I am going to present other two phonological arguments in favour of my proposal.

3. The ill-formedness of stop plus consonant clusters

In contrast with FC clusters, the combination of a stop and a consonant is not allowed in Italian phonotactics. Henceforth I will refer to the stop+consonant clusters as TC, where the capital T stands for each plosive, and C stands for any other consonant except liquids (indeed, stop+liquid clusters – e.g. [kr, kl, kj] – are well-formed in Italian).

In diachrony several repair strategies were acting in Italian phonology for solving TC clusters, but Italian foreign accent manifests that only a few of these remained active in synchrony. The two most popular diachronic strategies, deletion and assimilation, barely occur on the recordings of the corpus; instead of them we can encounter a large number of schwa-epenthesis between the members of the ill-formed TC cluster, e.g. *out*[ə]door, *up*[ə]grade, *back*[ə]slash, (Ger.) *Sing*[ə]spiel, etc. The rife occurrences of epenthetic processes, rather than deletion or assimilation, confirm the idea presented in the OT-analysis of tableau 1, that the ranking of the basic faithfulness constraints has changed in the last century of Italian phonology: the MAX-IO obtained a very high rank, while the DEP-IO a very low one. As a consequence, Italian phonology seems to be conservative in synchrony, that is, it seems to prefer the conservation of every segment of the input, even by the cost of allowing intrusive segments in the output.

In the case of Southern Italian informants another very interesting repair strategy was discovered: the gemination of the beginning stop in TC clusters. From my approach

it would be seen as another conservative epenthetic process which aims to avoid the lenition of the highly marked cluster, and therefore appeals to its fortition by gemination. In Chart (2) I collect a few examples from the foreign accent of Southern Italian informants (2a–f) and from the pronunciation of certain borrowings (2g–l).⁵ (For detailed examples, spectrogram images and statistical analyses see Huszthy 2015).

(2)		<i>target word</i>	<i>South. It. acc.</i>		<i>target word</i>	<i>South. It. pron.</i>	
	a.	(Eng.) <i>kept</i>	[ˈkɛp:tə]		g.	(It.) <i>sudcoreano</i>	[sud:əkoreˈa:no]
	b.	(Eng.) <i>selected</i>	[seˈlek:tɪd]		h.	(It.) <i>opta</i>	[ˈɔp:ta]
	c.	(Eng.) <i>correctly</i>	[korˈrek:ˀtli]		i.	(It.) <i>tecnico</i>	[ˈtɛk:ˀniko]
	d.	(Sp.) <i>obstentoso</i>	[ob:ˀstenˈtoso]		j.	(It.) <i>abside</i>	[ˈab:side]
	e.	(Ger.) <i>gibt es</i>	[ˈgib:tes]		k.	(It.) <i>criptato</i>	[krip:ˀta:to]
	f.	(Ger.) <i>Doktor</i>	[ˈdɔkˈtɔr]		l.	(It.) <i>Etna</i>	[ˈɛt:əna]

In the examples of Chart 2 several schwa-epenthesis occur, but there are also several occurrences without. My hypothesis is that schwa-epenthesis and preconsonantal stop gemination are two independent repair strategies for solving a TC cluster, which sometimes appear together. The gemination can be interpreted as a solution of the ill-formed cluster, despite it seems its complication: the gemination as a fortition process resists to the contingent deletion of the segment, and supports its conservation.

The preconsonantal stop gemination process is an argument for the tautosyllabicity of /sC/ clusters in Italian phonology. Let me enlighten this statement by an OT-analysis. In tableau 2 I quest out the Southern Italian accented optimal pronunciation of the (Eng.) verb *kept* (2a), which derives from the sample phrase “The post-opening period is expressed in months and concerns the product correctly kept”. 6 of the 8 Southern Italian informants (2 girls and 4 boys, between 18 and 25, from Campania, Basilicata and Calabria, respectively) who pronounced this sentence, used a long /p/ in the word *kept*, and in 3 of these recordings is remarkable a schwa-epenthesis as well (such as [ˈkɛp:ətə]), in the other 3 cases the gemination occurs without a schwa.

/kɛpt/	MAX-IO	FOOT MIN	*TC (ONS)	CODAC (GEM)	DEP -IO	CODAC (SON)	CODAC (SIB)
a. (ˈkɛp).tə				*!	*	*	*
b. (ˈkɛt).tə	*!				**	*	*
c. (ˈkɛ).ptə		*!	*		*		
d. (ˈkɛp).ptə			*!		**	*	*
e. ^{ɪə} (ˈkɛpp).tə					**	**	**
f. (ˈkɛp.pə).tə					***!	*	*

Tableau 2. OT analysis of the Southern Italian accented pronunciation of *kept*

A candidate which is identical to the input – [kɛpt] – would fail by violating the NONFINAL constraint (and it also would be the only duty of NONFINAL), therefore neither of them is present in the analysis of tableau 2. Similarly, the PARSE-σ constraint is missing as well, because it is currently irrelevant (it is violated once by all of the

⁵ Glossary: d. *ostentatious*, e. *there is*, g. *South-Corean*, h. *opt for S3*, i. *mechanic*, j. *apsee*, k. *coded*

candidates). Apart from these modifications, there are other evolutions in tableau 2: the subdivision of the FOOT= $\mu\mu$ and the CODA COND constraints.

It seems that the preconsonantal gemination is analysable only by splitting up these complex constraints. In tableau 1 FOOT= $\mu\mu$ meant that the weight of the foot is minimum and maximum two moras; now we have two constraints expressing the two requirements: FOOT MIN and FOOT MAX. The first one has the same position in the ranking as the former FOOT= $\mu\mu$, while the second is very low ranked (lower than the other constraints of tableau 2, so it had no place in this analysis). There are several motivations supporting this subdivision in the phonology of Italian, because the domain of the foot often seems to exceed the weight of two moras, e.g. in the case of falling diphthongs (such as It. *euro* [('ε:w).ro]), prenasal stressed vowels (such as It. *standard* [('sta:n).dar.də]), or both (such as Eng. *painting* → It. acc. [('pe:jn).tinj.gə]); and the preconsonantal gemination is a similar case as well.

The CODA CONDITION of tableau 1 expressed that a coda consonant must be a sonorant, a part of a geminate or /s/. CODA COND is divided now in three subconstraints depending on its single requirements: CODA COND (SONORANT) means that the coda can be occupied by sonorants only, CODA COND (GEMINATE) means that only geminates or a part of a geminate can stay in the coda, and CODA COND (SIBILANT) allows only the /s/ in the coda. In Southern Italian pronunciation the first ranked coda condition constraint is the one concerning the geminates, while in Northern Italian pronunciation the one which regards the sonorants. As we will see, the coda condition for sibilants results a redundant constraint in all Italian varieties.

The winning candidate in tableau 2 is *e*, an output with gemination and without schwa-epenthesis. Candidate *a* fails because it contains a singleton obstruent which, by the way, violates all CODA COND constraints. Candidate *b* does not violate the CODA COND (GEMINATE), but it falls out because of the higher ranked MAX-IO, which punishes the regressive place assimilation. Candidates *c* and *d* contain a TC cluster in syllable onset, and this is not allowed by the newly introduced *TC(ONSET) constraint (which is responsible for the heterosyllabicity of TC clusters); in addition, candidate *c* violates the FOOT MIN constraint as well. In candidate *f* too much insertion happens compared to the other outputs, so it is eliminated by reason of the DEP-IO constraint. Finally, candidate *e* can win, since the gemination happens in the coda, and the geminate is not resyllabified, so the output does not violate the *TC(ONSET) constraint.

As mentioned above, the fact that preconsonantal stop gemination occurs only in Southern Italian varieties, can be explained by the different order of the CODA COND subconstraints. In Northern varieties the CODA COND (SONORANT) precedes the CODA COND (GEMINATE), and this way the winning form of the analysis would be candidate *a*, an ill-formed, but attested output in the dataset of the Northern Italian informants' foreign accent. In these analyses the potential schwa-epenthesis is seen as a following phonetic step, which derives from the accidental explosion of the plosive before another consonant, and from the phonological point of view it is irrelevant here.

However, the CODA COND (SIBILANT) subconstraint is a redundant constraint in both Southern and Northern Italian varieties, and it has no role in the OT-analyses. For this reason I conclude that the introduction of /s/ as a possible coda segment is useless in Italian phonology from an optimality theoretical approach.

4. About the lack of voicing assimilation in Italian phonology

My third argument for the possible tautosyllabicity of /sC/ clusters in Italian phonology regards the regressive voicing assimilation (hereinafter RVA). From the approach of *laryngeal realism* (Iverson–Salmons 1995; Honeybone 2002, 2005; Balogné Bérces–Huber 2010; Cyran 2014) Italian is a voice-language, as Romance languages in general, which means that the [voice] feature of obstruents is both distinctive (voiced and voiceless obstruents are in phonological opposition) and active (the [±voice] is spreading leftwards, so it provokes RVA). However, RVA appears to be defective in Italian phonology, since it is limited only to the /s/ phoneme. As I mentioned in section 2, /sC/ clusters are the only obstruent clusters in Italian native vocabulary, so the deficiency of RVA could be justified by this fact. But if the [voice] feature of obstruents were really active, it would contribute to RVA in loanwords and foreign accent as well (the control of laryngeal activity is one of the less conscious phase in speech articulation). Since voiced obstruents do not provoke RVA in Italian foreign accent, I assume that Italian is a specific voice-language, in which [voice] feature is distinctive, but inactive.

In Italian phonology, the voicing of /s/ before voiced consonants is a more complex phenomenon than RVA in general; according to Krämer (2003; 2005) I will call this kind of assimilation *s-voicing*. Preconsonantal *s-voicing* in Italian shows many common characteristics with typical RVA of voice-languages, but also other ones, which makes it a partially different phenomenon. For instance, *s-voicing* is triggered not only by obstruents, but sonorants and glides as well, e.g.: (Eng.) *snake* → (It.) ['zne:jk], (Fr.) *franchement* 'honestly' → (It. acc.) [fʁã'ʒmɔ:], (Ger.) *Lebensmittel* 'food' → (It. acc.) ['le:bənzmitel], (Eng.) *kalashnikov* → (It.) [ka'la'ʒnikov]; (Eng.) *swimming* → (It. acc.) ['zwi:miŋgʰ], (*Dafne*) *Basjad* → (It. acc.) [ba'zjad:ə] 'fictive name', etc. However, if sonorants and glides are unspecified for [voice], they could not act as triggers of RVA.

At the same time, *s-voicing* is inactive in sandhi position, which distinguishes it from traditional RVA, because it does not seem to be a postlexical process; e.g.: (Eng.) *silence drive* → (It. acc.) [sajlens 'drajv], *Pierce Brosnan* [pirs 'brɔ:znɛn], *Thomas Mann* (It.) ['tɔ:mas 'mannə], *Champion[s] League*, (Sp.) *la[s] banda[s] mu[z]icales* 'the music bands', etc. Italian foreign accent reveals that in other obstruent clusters RVA remains completely inactive, and in the Italian pronunciation can appear a fully voiced obstruent immediately next to completely voiceless one. In Chart 3 I collect a few examples for the lack of RVA in Italian foreign accent.

(3)	target words	→ Italian accented
a.	(Eng.) <i>catgut</i>	[kat'gat:ə]
b.	(Eng.) <i>upgrade</i>	[ap'grejdə]
c.	(Eng.) <i>backslash</i>	[,bek'zleʃʰ]
d.	(Ger.) <i>Singspiel</i>	['sing[pil]
e.	(Ger.) <i>glaubt</i> 'believe S3'	['qlawbtʰ]

Apart from the examples of Chart 3 there are some loanwords in Italian lexicon which contain an obstruent cluster with consonants of different voice value, e.g. *vodka* ['vɔ:dka], *afgano* [a'fga:no] 'Afghan', *gangster* ['ga:ŋgster], *eczema* [ek'dze:ma], etc. Furthermore, in some recent borrowings *s-voicing* seems to be inactive even before voiced consonants, e.g. *iceberg* [ajs'bɛrgə], *kashmir* ['ka:ʃmir], *krishna* ['kri:fna], etc.

A very interesting target word in Chart 3 is *backslash*, where the crucial point is the triple consonant cluster /ksl/: the expected realisation was [kzl], where /s/ get voiced

before /l/, but /k/ conserves its voicelessness. The word was pronounced 42 times by 10 Italian informants, however, less than one third of the informants applied s-voicing on the recordings, and there were many partly voiced occurrences of [s] as well. I assume that the (often intraspeaker) vacillation of voicing or devoicing in the case of /s/ is due to the vacillation of /sC/ as a tautosyllabic or as a heterosyllabic cluster. I suggest that s-voicing is possible only if the /sC/ cluster is parsed into the onset.

In tableau 3 I propose an OT-analysis for the optimal Italian accented pronunciation of *backslash*. The input form is the usual English pronunciation /'bækslæʃ/, but, since vowel quality is irrelevant in this analysis, the vowels are indicated with a capital V in the outputs (the informants used three vowels to replace the [æ] of the input: [a, ε, e]). My supposition is that the optimal appearance of the /sl/ cluster is [zl], even if [z] is preceded by a voiceless /k/.

	/ 'bækslæʃ/	ID(VOI) [-SIB]	CODAC (SON)	CODAC (GEM)	AGREE (tautosyll.)	IDENT (VOICE)	AGREE
a.	'bVks.sIVʃ		**	**!	*		
b.	bVks.'IVʃ		***!	***	*		
c.	bVks.'sIVʃ.ʃə		**	*	*!		
d.	bVks.'zIVʃ.ʃə		**	*		*	*
e.	bVg.'zIVʃ.ʃə	*!	**	*		**	

Tableau 3. OT analysis of the Italian accented pronunciation of *backslash*

The newly introduced constraints in tableau 3 derive from the optimality theoretical framework of RVA (Ringen–Helgason 2004; Siptár–Szentgyörgyi 2013). IDENT (VOICE) is a constraint family of faithfulness, which guards the correspondence of the [voice] feature between input and output. For Italian phonology I use a subconstraint of its, which is limited to the non sibilant consonants: with the high ranking of ID(VOI) [-SIB] only the sibilants may change their voice value in a consonant cluster. This way the voicing of /k/ before [z] (like in candidate *e*) is impossible (and it never occurs among the dataset). The other innovation is a markedness constraint family, AGREE, which requires that adjacent consonants share their voice value. I use a subconstraint of its as well, which punishes the tautosyllabic clusters of voiced and voiceless consonants.

Candidates *a* and *b* fall out from the analysis by violating the coda condition constraints (among which the ranking is currently unspecified, since we are talking about Italian accent in general); since Italian does not have branching codas, /s/ cannot appear in the first syllable after /k/, and it has to be tautosyllabic like in candidates *c*, *d* and *e*. Another possibility for /s/ is to constitute a separate syllable alongside a schwa and /k/ (such as [be.kəz.'lɛʃ.ʃə]), but in this case it would be eliminated because of the too much insertion (by DEP-IO or PARSE-σ, when the foot will be considered relevant). A further possibility is to deal with /s/ as with an extrasyllabic element: [bek.s.'lɛʃ.ʃə], but this treatment leaves unanswered many questions. Nevertheless, probably this is happening when /s/ does not get voiced; in a few of the recordings the informants omit /s/ completely: *ba[kl]ash*; while in others they leave a very small cease (about 2–5 milliseconds) after /s/ in the cluster (without introducing a schwa); in the latter case /s/ never gets voiced. But if we adopted [bVks.s.'IVʃ.ʃə] as a candidate in tableau 3, it would win the analysis, and the output with s-voicing would fail.

However, the analysis of tableau 3 can be developed with the refinement of the two further complex constraints: ID(VOI) [–SIB] and AGREE(tautosyll.). If instead of ID(VOI) [–SIB] we use two more general constraints which compound the two most important [feature] of sibilants: [fricative] and [coronal], our problem can be resolved, and we may also ignore the AGREE(tautosyll.) constraint. Therefore, I propose to introduce two new constraint of the IDENT(VOICE) family: ID(VOI) [–FRICATIVE] (only fricatives may change their voice value) and ID(VOI) [–CORONAL] (only coronals may change their voice value). The new ranking of the constraints is below (4).

(4) *Ranking of constraints about preconsonantal s-voicing in Italian:*

ID(VOI) [–COR.] » CODA COND (SON), CODA COND (GEM) » ID(VOI) [–FRIC.] » AGREE

With the set of constraints below (4) all consonant clusters are analysable in Italian (and in Italian foreign accent) from the point of view of RVA. The analyses reveal that /sC/ clusters are tautosyllabic in Italian phonology, otherwise preconsonantal s-voicing would be blocked. For instance, if we consider a stop+liquid cluster as the input – such as (It.) *apro* ‘open, S1’ – the winning candidate will be [‘a:.pro]; and not [‘a:.bro] which violates the ID(VOI) [–COR.] constraint, or [‘ap.ro] which falls out because of the coda condition. Similarly, an input with a coronal stop – such as *litro* ‘litre’ – cannot generate the voicing of /t/ because of the ID(VOI) [–FRIC.] constraint. Nonetheless, /s/ will change its voice value before a voiced consonant, e.g. the winning candidate of (It.) *asma* ‘asthma’ will be [‘a:.zma], and not [az.ma] or [a:.sma].

The analysis of *backslash* will slightly modify with the use of the constraints below (4): there will be two winning candidates: *c* and *d* of tableau 3 (with s-voicing and without; and if we used the hypothetical output with extrasyllabic /s/, that would also win). The explanation is probably the excessive complexity of the triple cluster /ksl/, where the voiceless /k/ can block the s-voicing in the /sl/ group; so there are more optimal forms in this case, and the choice between the winning candidates is up to the speakers. However, the /sC/ cluster is parsed as tautosyllabic in both cases; or it can be extrasyllabic as a third possibility, but this treatment would raise several other problems, such as with these OT-settings an extrasyllabic /s/ cannot be the subject of s-voicing.

5. Conclusions

In this paper I mentioned three phonological arguments against the widespread opinion to treat /sC/ clusters as universally heterosyllabic. My arguments concerned exclusively the phonology of Italian, since Italian seems to be a special language, the case of which proves that a basically heterosyllabic sequence as /sC/ can get reanalysed in certain phonological contexts, or in certain languages. Notwithstanding that, I suppose that the tautosyllabic behaviour of /sC/ clusters is a highly marked phenomenon. All the same, Italian is a language, which is able to support even highly marked phonological phenomena, because the phonology of Italian is conservative in synchrony, and it aims to maintain ill-formed sequences as well, instead of appealing to their reduction, which is well illustrated by the case of stop+consonant clusters (see section 3).

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