

Intervocalic s-voicing, geminates and the Richness of the Base in Veneto Italian[★]

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1 Introduction

Since Nespor & Vogel (1986), the coronal fricative in Northern Italian has been subject to a long debate on what exactly intervocalic s-voicing in Italian can tell us about grammar and the organisation of words (Bertinetto 1999, Kenstowicz 1996, Loporcaro 1999, Peperkamp 1995, 1997, van Oostendorp 1999, Krämer 2001a, in press). In this paper, I examine the distribution of voiced and voiceless coronal fricatives in a variety of Veneto Italian, in particular the local variety that is spoken in Padua.

Veneto (or Paduan) has no geminate consonants, i.e., all consonants which are long in other varieties are short. Coronal fricatives which have geminate correlates in other varieties are short and voiceless in Veneto. Voiced affricates surface as voiced fricatives word-initially. Altogether this creates a surface contrast between voiced and voiceless fricatives in word-initial position (1a,b), word-internally (1c,d) and prefix-finally (2a versus d,e). This becomes interesting when we compare Veneto with varieties which display intervocalic voicing, such as Lombardian, because all coronal fricatives which are voiced due to intervocalic voicing in Lombardian are voiced as well in Veneto.

(1) Contrast in Veneto

- | | | |
|----|--------|-----------------|
| a. | [s]eta | 'silk' |
| b. | [z]eta | 'z' |
| c. | ca[s]a | 'cash register' |
| d. | ca[z]a | 'house' |
| e. | ga[s] | 'gas' |

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(2) Affix-final contrast in Veneto

- a. di[z]-onesto 'dishonest'
- b. di[sp]iacere 'displeasure'
- c. di[zg]razia 'misfortune'
- d. tra[s]-alpino 'transalpine'
- e. e[s]-amico 'ex-friend'

In this paper, I argue that the most straightforward analysis of these patterns in Veneto as a voicing contrast does not account for some striking features of the pattern and above all does not account for the correlation we find with other varieties. One approach to saving the surface-true contrast analysis would be to provide a coherent historical account for the data. This route encounters two problems: a) a historical analysis adhering to the strict principles developed within Optimality Theory runs into theoretical problems, as will be discussed in section 2 and b) it runs into empirical problems with Veneto speakers' performance on nonsense words. In such words, speakers show a tendency to voice voiceless singleton coronal fricatives. Accordingly I will propose an analysis establishing the Veneto patterns as a case of phonological opacity according to which intervocalic s-voicing is an active constraint on the Veneto grammar but is violated in cases of cluster reduction in favour of producing a less marked output structure. This analysis will be formalised as the effect of a local constraint conjunction, following Itô & Mester (1998), Lubowicz (1999, 2002), Moreton & Smolensky (2002).¹

2 Cross-dialectal comparison

Though the data in (1) and (2) seem to provide straightforward evidence for a voicing contrast in coronal fricatives, doubts on the correctness of this analysis occur when Veneto is compared to closely related varieties of Italian. Consider the word-internal contrasts in (3).

(3) Word-internal coronal fricatives in Veneto, Lombardian and Tuscan

Veneto	Lombardian	Tuscan	gloss
a. ca[z]a	ca[z]a	ca[s]a	'house'

¹ Nothing depends on this choice of formalism. The data might equally well be analysed in other OT formalisms developed to capture phonological opacity, e.g., Kiparsky (1999), McCarthy (2002). Which approach suits these data best or whether Veneto can contribute anything to the discussion on which of these formalisms is the most appropriate to handle phonological opacity in general is also a question beyond the scope of this paper.

b. co[z]a	co[z]a	co[s]a	'thing'
c. ca[z]o	ca[z]o	ca[z]o	'case'
d. ca[s]a	ca[s:]a	ca[s:]a	'box, cashier'
contrast: voice	length	both	

Going through the table from right to left we see that Tuscan has a three-way contrast between long and short and between voiced and voiceless among short fricatives. The voicing distinction is neutralised intervocalically in Lombardian, which leaves only the length contrast. Veneto has voiced fricatives in all the positions where Lombardian has them. Thus one might conclude that either intervocalic voicing is active synchronically in Veneto or that it was active in an earlier stage, i.e., Tuscan being the most conservative variety and Veneto the most innovative with Lombardian a representative of an intermediate stage between both. However, a generalisation that intervocalic s-voicing is active in Veneto is contradicted by the emergence of short voiceless fricatives where the other two varieties have geminates.

All the word-initial instances of voiced [z] are affricates [d͡z] in the other varieties, i.e., we find [d͡zeta] 'z' instead of [zeta]. Here a complex segment with two specifications for continuancy or an extra manner specification (depending on the analysis of affricates one subscribes to, cf. van de Weijer 1996 and Kehrein 2002, and references cited there) is reduced to a simplex one with retention of voicing, just as in the case of geminates a complex segment with two timing slots is simplified.

We find a situation parallel to the shortening of geminates when we look at word-internal clusters. Veneto avoids nasals in coda position (4b,c) as well as stops (4d). Where we find a stop-s sequence in the other two varieties, this creates an intervocalic coronal fricative in Veneto, as in the data in (4b,c,d).

(4) Degemination and coda avoidance in Veneto

a.	[rɔ:za ro:sa]	rosa rossa	'red rose'
	[sa:si]	sassi	'stones'
	[kase:ta]	cassetta	'cassette, tape'
	[ka:sa]	cassa	'box'
	[lɔ:to]	lotto	'lotto'
	[fre:do]	freddo	'cold'
b.	[kɔ̃si:ʎo]	consiglio	'advice'
	[vakã:se]	vacanze	'holidays'

	[pẽsa:re]	pensare	'to think'
c.	[trãsalpi:no]	transalpino	'transalpine'
	[trãsatlã:tiko]	transatlantico	'transatlantic'
d.	[esami:ko]	ex-amico	'ex-friend' [eksami:ko]
	[subokoʃẽte]	subcosciente	'subconsciousness'

Where coda nasals or oral stops are deleted, we find a voiceless fricative in intervocalic position, see (4b) and (4c). The emergence of the voiceless fricative prefix-finally in the first two words in (4c) also poses a problem to a historical explanation of the Veneto pattern as having emerged from an earlier variety which was basically like Lombardian. In Lombardian, we find words like *transalpino* containing a postnasal voiced fricative. Thus, we would expect the same voicing specification in the Veneto form, which is not attested.

However, a historical approach within Optimality Theory faces another problem: Diachronic changes are generally analysed as changes in the constraint ranking from one historical stage of a grammar to the next. In this case, the exact changes in the constraint ranking are hard to motivate – if at all.

In OT, intervocalic s-voicing is captured as the effect of a high ranking markedness constraint, which one might abbreviate as *VsV (see Kenstowicz 1996, and Krämer 2001, in press for further discussion of this constraint). Furthermore historical changes are best analysed as reranking of constraints from one generation of speakers to the next generation. Here the potential limits to constraint reranking become crucial. According to the most widely held view on language acquisition within OT, children start out with a ranking of all markedness constraints in a higher stratum than all faithfulness constraints (Ganadesikan 1995, Tesar & Smolensky 2000). From this universal initial state, children build up the grammar of their ambient language by stepwise demotion of markedness constraints below faithfulness constraints until they arrive at a constraint hierarchy which has an exhaustive ranking. Historical change then can be captured as an epiphenomenon of learners not demoting all the markedness constraints in the way they should.

From a variety such as Tuscan with an intervocalic voicing contrast in coronal fricatives as a starting point it is easy to arrive at a variety with intervocalic s-voicing, such as Lombardian. The markedness constraint *VsV has to outrank faithfulness to voice in the initial stage of every learner. To arrive at Tuscan a learner demotes *VsV below faithfulness. Historically, then a generation of Lombardian learners just did not do this step in the acquisition and left the markedness constraint in a higher stratum than faithfulness.

(5) *VsV and faithfulness

Initial stage: MARKEDNESS >> FAITHFULNESS (*VsV >> IDENT(voice))

Tuscan: IDENT(voice) >> *VsV (achieved by demotion)

Lombardian: *VsV >> IDENT(voice) (= initial stage)

The question now is how do we get from a Lombardian-type variety to Veneto? What we have to work out is how to arrive at the Tuscan-type ranking from Lombardian without accidentally predicting voicing of all degeminated formerly long coronal fricatives. Since the more conservative (actually most) Italian varieties have geminates, I assume that historically Veneto had geminates, just like Lombardian today. Degemination, though, can only have happened after intervocalic s-voicing became in-active. At the historical stage, though, where demotion of *VsV below faithfulness is required, the learners do not encounter any evidence for demotion of this constraint since intervocalic fricatives are either long or voiced.

As long as this historical conundrum cannot be solved and as long as the historical account can not explain the voicelessness of formerly postnasal coronal fricatives, any account that just posits a voicing contrast for Veneto misses some crucial generalisations. Why do we find voicelessness only with reduced clusters/geminates? And why are all those fricatives voiced which are voiced in varieties with intervocalic s-voicing?

In the following section, I will provide an account which captures these correlations between dialects as a phonological opacity effect. The grammar I propose shows stability in the sense that whatever surface form from Tuscan or Lombardian one feeds into this grammar as an input, the corresponding Veneto surface form will be the only optimal output. By this property, the grammar adheres to the Richness of the Base hypothesis (Prince & Smolensky 1993), a corner stone of OT, which would have to be sacrificed in a surface-true analysis of Veneto as displaying a voicing contrast in intervocalic fricatives.

(6) Richness of the Base (Smolensky 1996: 5)

The source of all systematic cross-linguistic variation is constraint reranking. In particular, the set of *inputs* to the grammars of all languages is the same. The grammatical inventories of a language are the *outputs* which emerge from the grammar when it is fed the universal set of all possible inputs.

3 Opacity in Veneto Italian

In a derivational rule-based account, the Veneto voicing pattern and its correlations with neighbouring varieties could be captured as follows. Veneto has underlying geminates as well as underlying stop-fricative clusters. In a first step intervocalic s-

voicing applies, which voices all simplex intervocalic coronal fricatives. In a next step geminates are shortened and all stops in coda position are deleted. Since intervocalic s-voicing does not re-apply we find targets of this rule in the context where it should apply. This is summarised schematically in (7).

(7) Ordered rules in Veneto

	/trans- + alpino/	/kassa/	/dis- + onesto/
1. syllabification	↓	↓	↓
	tran.s#al.pi.no	kas.sa	di.s#o.nes.to
2. layering/bracket erasure	↓	↓	↓
	(tran.sal.pi.no)	(kas.sa)	(di.so.nes.to)
3. s-voicing	↓	↓	↓
	<i>n.a.</i>	<i>n.a.</i>	di.zo.nes.to
4. nasal coda deletion, degemination	↓	↓	↓
	tra.sal.pi.no	ka.sa	<i>n.a.</i>
5. output	↓	↓	↓
	tra.sal.pi.no	ka.sa	di.zo.nes.to

In Optimality Theory chronological ordering of constraints is not a choice, since candidates are evaluated in parallel by hierarchically ordered constraints. If intervocalic s-voicing is to be regarded as an active pattern in Veneto, the constraint responsible, *VsV, has to outrank faithfulness constraints. This creates a situation where all instances of *s* in intervocalic position are dispreferred over *z*, even those which are not in this position underlyingly.

Degemination is triggered by a high ranking markedness constraint against geminates, abbreviated as *GEMINATE here (one might argue this to be a member of a family of OCP constraints). Deletion of post-vocalic and pre-fricative nasals can be attributed to a high ranking condition on codas, such as NOSTOPCODA. These constraints are listed in (8). This results in the grammar sketched in (9) which chooses the wrong candidates as output forms, as indicated in (10).

- (8) a. *VsV: No intervocalic *s* within a prosodic word.
 b. *GEMINATE: Geminates are not allowed in surface structures.
 c. NOSTOPCODA: No stops are allowed in coda position.
 d. FAITHFULNESS: Correspondent segments in input and output are faithful.
 (I.e., segments in the input have to be present in the output and vice versa {MAX, DEP}, correspondent segments in input and output have to have identical feature specifications {IDENT} etc.)

(9) A first ranking for Veneto²

*GEMINATE, NOSTOPCODA, *VsV >> FAITH

In tableau (10), the wrongly predicted output is marked by a \bullet^* , while \ominus indicates the desired output.

(10) Predicting the wrong pattern

i.	/trans-alpino/	*GEMI	*VsV	NOSTOPCODA	FAITH
a.	transalpi.no			*!	
\ominus b.	trasalpino		*!		*
\bullet^* c.	trazalpino				**
ii.	/kassa/				
c.	kassa	*!			
\ominus d.	kasa		*!		*
\bullet^* c.	kaza				**

The key to a grammar which produces the correct output forms lies in the constraints which are violated by the now optimal candidates and the desired ones. The context where intervocalic s-voicing is blocked is where a segment surrounded by other segments is not mapped to the surface. Such a deletion of a morpheme-internal segment violates the contiguity constraint (McCarthy & Prince 1995), which states that corresponding input and output should consist of a contiguous string of segments, i.e. segments which are adjacent to each other in the input should also be adjacent to each other in the output. Insertion inbetween two segments which are adjacent in the input is banned as well as deletion of a segment inside a given string. In (11), I have given McCarthy & Prince's definition of the instantiation of the constraint which prohibits skipping.

(11) I-CONTIGUITY ("No Skipping", McCarthy & Prince, 1995):

The portion of S_1 standing in correspondence forms a contiguous string.

Domain (\mathfrak{R}) is a single contiguous string in S_1 .

$\mathfrak{R} /xyz/ \rightarrow xz$

² I have not divided up faithfulness constraints in more detail here to keep the presentation simple, but for instance constraints against insertion (DEPIO) have to outrank the rest of this grammar, since otherwise we would find epenthesis as a strategy to avoid violations of the constraints considered here.

Furthermore the undesired candidates which violate I-Contiguity all violate the markedness constraint against voiced obstruents as well.

(12) VOP: 'Voiced obstruents are prohibited.'

Intervocalic s-voicing is blocked where a segment is skipped. One can conceive of this blocking effect as avoidance of "the worst of the worst" (Prince & Smolensky 1993). That is, candidates which violate two constraints in the same locus are judged worse than candidates violating only one of these constraints or than those which violate both constraints independently of each other, i.e., in different segments. Formally this is achieved by local constraint conjunction of the two crucial constraints. A local conjunction of two or more constraints is itself a complex constraint which can be ranked higher in the hierarchy than the individual constraints involved in the conjunction. Such a complex constraint is violated if and only if within its local domain, usually that of the segment, all the conjoint constraints are violated. If only one of the conjoint constraints is satisfied by the segment in question the whole local conjunction is satisfied as well (see Smolensky 1993, 1995, Kirchner 1996, Crowhurst & Hewitt 1997, Alderete 1997, 1999, Itô & Mester 1998, Lubowicz 1999, 2002, Baković 2000, Krämer 2000, 2001a,b, Moreton & Smolensky 2002 for discussion and various applications of local conjunction).

(13) Definition of Local Conjunction (Smolensky 1993)

The local conjunction of C_1 and C_2 in domain D $[C_1 \& C_2]_D$ is violated when there is some domain of type D in which both C_1 and C_2 are violated.

(14) Local Conjunction of faithfulness and markedness:

I-CONTIGUITY & VOP.

Violated by violation of both constraints within the same local domain, i.e., the same segment.

Both simple constraints have to be ranked quite low in the Veneto constraint hierarchy. Otherwise we would neither observe any degemination or deletion nor any voiced obstruents in Veneto. The local conjunction of both constraints, however, can be ranked independently of the involved constraints, and it has to be ranked in the top stratum of the Veneto hierarchy to block intervocalic s-voicing. The grammar including the local conjunction is shown at work in the following tableaux (15, 16). I have omitted the two individual constraints since they are lowly ranked and doomed to irrelevance in Veneto.

(15) The fate of underlying geminates in Veneto

	*GEM	I-CONT&VOP	*VsV	FAITH
a. /kassa/ ~ kassa	*!			
☞ b. /kassa/ ~ kasa			*	*
☠ c. /kassa/ ~ kaza		*!		**
d. /kasa/ ~ kassa	*!			*
e. /kasa/ ~ kasa			*!	
☞ f. /kasa/ ~ kaza				*

(16) The fate of underlying consonant clusters in Veneto

/trans-alpino/	NOSTOPCODA	I-CONT&VOP	*VsV	FAITH
a. tran.sal.pi.no	*!			
☠ b. tra.zal.pi.no		*!		**
☞ c. tra.sal.pi.no			*	*

With this grammar in place one might still argue that Veneto has no underlying geminates at all and no underlying nasal + s clusters, since learners never encounter any of these in surface forms. This argument is also driven by the theory-internal mechanism of Lexicon Optimization (Prince & Smolensky 1993, Inkelas 1994, Yip 1996). According to Lexicon Optimization speakers store those underlying forms which incur the least significant amount of constraint violations when mapped to the optimal output. Tableau (17) shows this for the form [kaza] 'house'. In this tableau the same output is paired with different input candidates (rather than pairing the same input with different output candidates, as is usually the case). The only pair which does not incur any constraint violations is the one where the input is completely identical to the output, hence this input is chosen by learners as the optimal underlying representation for 'house'.

(17) Lexicon optimization

	*GEM	I-CONT &VOP	*VsV	IDENT (length)	IDENT (voice)
a. /kassa/ ~ kaza		*		*	
b. /kasa/ ~ kaza					*
☞ c. /kaza/ ~ kaza					
d. /kassa/ ~ kasa			*	*	
☞ e. */kasa/ ~ kasa			*		
f. */kaza/ ~ kasa			*		*

However, if learners were to store underlying geminates as single voiceless segments instead, these would resurface as voiced as shown in (d-f) in tableau (15). Underlying voiceless short coronal intervocalic fricatives are relentlessly mapped to voiced correspondents by this grammar. The input-output pair /kasa/ → [kasa] is not a grammatical mapping in Veneto (15e), hence the mapping (17e) is not a possible mapping in the Lexicon Optimization tableau (17). The input-output pair (17f) is not a grammatical mapping either, since any underlyingly voiced intervocalic coronal fricative will always choose an identical form as its favourite output candidate with this grammar, which is illustrated in tableau (18). Hence, (17f) is not possible and the only input-output pair for voiceless intervocalic fricatives has a geminate in the input.

(18) The optimal output for underlying /kaza/

	*GEM	I-CONT &VOP	*VsV	IDENT (length)	IDENT (voice)
☞ a. /kaza/ ~ kaza					
b. /kaza/ ~ kasa			*!		*

The same argument holds for the post-vocalic nasals. Any input without the nasal would be mapped to a voiced *z*, as with the prefixes *dis-*, *bis-*, *mis-*, or with any potential intervocalic *s* in the input. This is illustrated in (19). The local conjunction is vacuously satisfied by all output candidates, since candidates with these underlying representations never violate I-CONTIG, due to the lack of unparsed segments.

(19) Predicting abstract nasals

*/tras-alpino/	NOSTOPCODA	I-CONT&VOP	*VsV	FAITH
⊗ a. trasalpino			*!	
● ^{sc} b. trazalpino				*
/dis-onesto/				
c. disonesto			*!	
☞ d. dizonesto				*

Here the question arises how learners arrive at these abstract representations. The nasals leave a surface reflex on the preceding vowel. If children use this phonetic reflex and the lack of voicing in the fricative as cues to the underlying nasals, they have the prerequisites to put the grammar in place. Having the grammar right, they have to store the voiceless intervocalic fricatives as geminates, since they cannot produce the right outputs from underlying forms which are surface-true.

This grammar also accounts for an astonishing fact which I encountered when checking data from the literature with my informants. I asked them to produce the diminutive form of *bus*, which should be *bu[s]ino* according to Kenstowicz (1996). All informants apart from one rejected the form *bu[s]ino*, claiming they would never say this word. This finding is coherent with observations by Bertinetto (1999) as well as other researchers. However, the speakers from Padua as well as from Lombardia discussed the matter further and while repeating the ungrammatical form in this discussion the word was realised as [buzino] with a voiced fricative. This is especially relevant for the analysis of Veneto since this would not have happened if the variety had a straightforward voicing contrast with faithfulness outranking the constraint on intervocalic s-voicing.

This realisation of a nonsense word confirms the Richness of the Base Hypothesis cited above, according to which speakers of a particular language (or dialect) should produce the patterns of their language from any possible input. Here we have clear evidence for this, and we have a synchronic grammar which accommodates this fact.

The analysis proposed here also accounts for the fact that word-initial affricates when realised as fricatives in Veneto (as in [zia] 'aunt', realised as [d̪zia] in other varieties) are not realised as voiceless. Since the reduction process does not apply morpheme-internally in these cases, the constraint I-CONTIG is not violated and violation of the VOP does not matter. Word-internally, affricates do not undergo reduction, because they consist of only one segmental position, hence no coda is present and any coda restriction cannot be violated to trigger reduction (see Kehrein 2002 and references cited there on the analysis of affricates).

4 Conclusion

Veneto is not a unique case with regards to exceptional behaviour of geminates, see for instance the patterns of voiceless consonants in Ojibwa (Piggott 1980), Ségéral & Scheer's discussion of virtual geminates in Cologne German and Somali or the sound change similar to the Veneto pattern observed in Gallo-Romance by Bourciez & Bourciez (1967). In the latter, intervocalic *t* is realised as voiced, while voicing is blocked in geminates which surface as short *t*.

Rather than analysing the Veneto pattern as a case of phonological opacity, one might be tempted to view this as an instance of geminate inalterability and posit a constraint which exempts underlying geminates from phonological processes (see Kirchner 2000, Hayes 1986, Schein & Steriade 1986, Kenstowicz 1982, Guerssel 1977, and many more on geminate inalterability). However, the fact that in Veneto Italian the prefixes *ex-* ([eks] in other varieties) and *trans-* and other word-internal nasal+obstruent sequences behave in the same way as geminates is clear evidence against such an analysis in this case. Thus, the analysis tracing all three different instances of the blocking of intervocalic s-voicing to the same source is on the right track.

In summary, in this paper I have added to the evidence that languages can have fairly abstract underlying representations which never surface. The analysis proposed in this paper has shown that even a surface-oriented framework like Optimality Theory is able to cope with such abstract underlying forms. The grammar proposed here generates the appropriate abstract underlying representations for all possible outputs, and if surface forms from other varieties are taken as inputs the grammar produces only 'Veneto-typical' outputs. These properties adhere to the Richness of the Base Hypothesis and Lexicon Optimization (Prince & Smolensky 1993, Inkelas 1994). On the other hand, the data discussed here and the analysis given contradict aspects of the original proposal on Lexicon Optimization. According to Inkelas (1994) underlying representations are supposed to be as close to surface representations as possible. This generalisation cannot be maintained as such, though, more research is needed in this direction.

Finally, the discussion led here opens up further questions to be answered in future research. Having rejected a purely historical account of the Veneto data, it is still unclear how Veneto historically arrived at this opaque grammar. From a synchronic perspective, it has to be investigated how children actually learn such a grammar. Furthermore, with regards to Richness of the Base it has to be examined in more detail how stable such an opaque grammar really is, i.e., how robust is the process of assimilation of nonsense words by native speakers.

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