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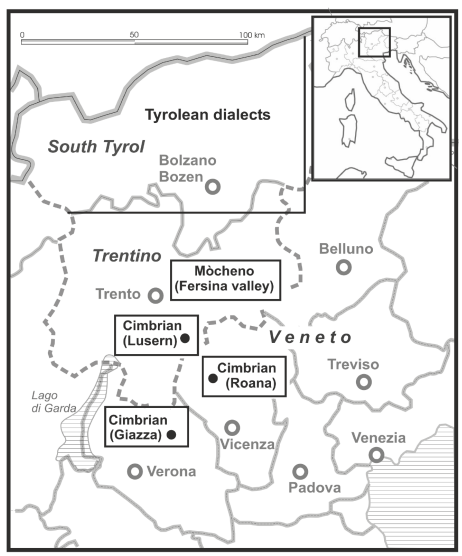
Birgit Alber

Obstruent Systems of Northern Italy[1]

1. *Introduction*

The area of the Southern Central Alps, located in a virtual triangle between the cities of Verona, Vicenza and Bolzano/Bozen, forms a particularly rich linguistic habitat where Romance varieties have lived in contact with Germanic varieties for centuries. In the northern part of this area, in the region of South Tyrol, the Tyrolean dialects, which form the southernmost part of the German language area, encounter the northernmost tip of the Italian speaking area. In the southern part, the province of Trentino and the region of the Veneto, Romance varieties such as the Italian dialects spoken in Veneto and Trentino, live in close contact with the historical Germanic language islands of Mòcheno, spoken in the Fersina valley and Cimbrian, spoken in the villages of Lusern, Giazza and Roana:

(1) Germanic varieties in Northern Italy (Veneto - Trentino - South Tyrol)[2]



[1] For helpful comments and suggestions I thank the audience of the Italian Dialect Meeting, Leiden 2012, Alan Prince, Stefan Rabanus, Anthony Rowley and two anonymous reviewers.

[2] Map courtesy of Stefan Rabanus.

Over time, the multitude of Romance and Germanic varieties in contact have been subject to scientific interests of various kind, be it dialectological, historical or sociolinguistic (Kranzmayer 1956, Schweizer 2008 [1951/1952], Schweizer 2012 [1954], Rowley 1986, Tyroller 2003, Dal Negro 2011, among others). In what follows, I will present first results of a project[3] exploring the synchronic linguistic structure of these varieties, specifically, the structure of their phonological system[4]. The goal of the project is (a) to explore the features of *microvariation* (Kayne 2000) emerging between related varieties, (b) to determine whether (for the Germanic varieties) any typical features of language islands can be found, such as particularly *conservative* structures or (c) *innovations* unknown in other German dialects and, finally, to determine whether (d) *language contact* has left any traces in the structure of the languages involved.

At this stage of the project, analysis has been completed for the obstruent system of the relevant varieties, regarding the inventory and contextual distribution of voiced and voiceless obstruents. Microvariation between Germanic varieties occurs with respect to a phenomenon of intersonorant voicing of fricatives (compare e.g. Mòcheno *ʃloːvn̩*, ‹to sleep›, with its Standard German cognate *ʃlaːfən*). Intersonorant voicing of fricatives occurs productively in the varieties of Mòcheno and Cimbrian (Lusern), but not in the Cimbrian varieties of Giazza and Roana, nor in Tyrolean. It can be interpreted as a conservative feature, maintained from earlier stages of the German Language. At the same time, the phenomenon has some innovative aspects, in that it involves all fricatives, differently from what happened in Middle High German (see also Alber, in press).

Microvariation is analyzed here in the framework of Optimality Theory (Prince&Smolensky 1993 [2004]) and it is shown that the phenomenon can be modeled as minimal reranking between constraints, embedded in a core grammar common to all Germanic varieties. The analysis thus assumes discrete ranking of constraints, following previous

[3] Data collection for this project has benefited from funding by the Cariverona Foundation for the project *Cimbrian as a test case for synchronic and diachronic language variation* (see Agosti et al. 2011). An extended version of the project, involving syntactic and morphological variables as well as aspects of geolinguistics, has been developed together with my colleagues Stefan Rabanus, Alessandra Tomaselli (University of Verona), Ermenegildo Bidese and Patrizia Cordin (University of Trento).

[4] For work on Mòcheno and Cimbrian syntax driven by a similar interest see, among others, Bidese, Poletto & Tomaselli 2006, Bidese & Tomaselli 2007, Bidese 2008, Poletto & Tomaselli 2009, Bidese&Padovan 2012, Cognola 2013.

work on variation (among others, Anttila 1997, 2002 , van Oostendorp 1997, in prep.; for different approaches to variation cf. Boersma 1998 and Boersma&Hayes 2001).

The comparison between the obstruent system of the Romance and Germanic varieties of the area shows so far that there is only one phenomenon which might be interpreted as the result of contact-induced change, the phenomenon of final devoicing of obstruents, which occurs both in the Germanic varieties and in Romance contact varieties of the Trentino. However, final devoicing can be interpreted as the result of selection of unmarked structures. Since unmarked structures may arise spontaneously in language change, final devoicing in Romance varieties is not necessarily a result of contact (see also Alber, Rabanus & Tomaselli 2012).

2. *Data*

Data regarding the obstruent system of the relevant varieties has been collected in fieldwork 2011-12, carried out in collaboration with two students of the university of Verona (Costanzi 2012, Fontana 2012). On the basis of the existing literature (Rowley 1986 for Mòcheno, Tyroller 2003 for Cimbrian [Lusern], Schweizer 2008 [1951/1952], for Cimbrian [Giazza, Roana], Zamboni 1974 for Veronese and Vicentino) questionnaires were prepared for each variety, containing approximately 300 words with obstruents in all relevant phonological contexts. With respect to informants from the Germanic language islands, data was elicited both for their Germanic and their Romance variety, to guarantee the closest possible contact situation (language contact in the same - bilingual - speaker). Whenever possible, the informant was asked to translate words from a language different of the language subject to elicitation, to exclude influence by the interviewer.

Data was also collected for the Romance contact varieties spoken by monolinguals, to observe structures outside of the bilingual context (control varieties), but no differences with respect to the Romance varieties spoken by bilinguals were detected in the obstruent system. Sessions were recorded and transcribed phonetically.

The varieties involved in data elicitation are the following (interviews have not yet been carried out for all of them, see comments below):

(2) Varieties involved in data collection
   a. Germanic varieties:
      - Mòcheno, variety of Palai (one speaker, 46 years)
      - Cimbrian, variety of Lusern (not yet elicited, data below is from Tyroller 2003)
      - Cimbrian, variety of Giazza (3 speakers, 70 years, on average)
      - Cimbrian, variety of Roana (2 speakers, 94 and 97 years)
      - Tyrolean, variety of Meran (data comes from my own competence as a native speaker as well as from the description of Bauer 2011)
   b. Romance contact varieties of bilinguals (language islands: same informants as in a.)
      - Trentino variety: for Mòcheno,
      - Trentino variety: for Cimbrian of Lusern [not yet elicited]
      - Veronese: for Cimbrian of Giazza
      - Vicentino: for Cimbrian of Roana
      - Regional Northern Italian (RNI): for Tyrolean
   c. Romance contact varieties of monolinguals (control varieties)
      - Trentino, Veronese, Vicentino (for the latter two, see Costanzi 2012, Fontana 2012)
      - Regional Northern Italian (RNI) (following descriptions in Krämer 2009 and Nespor 1993)

3. *The obstruent system of Germanic varieties*

3.1. *Common features*

In the Germanic varieties under investigation, obstruents contrast in voicing, not in aspiration, differently from other German dialects (cf. Braun 1996, Moosmüller&Ringen 2004, for a discussion of Standard German see Jessen&Ringen 2002)[5]. This contrast is neutralized in word-final, and, in part, in word-medial contexts.

All Germanic varieties presented in (2) exhibit the phenomenon of final devoicing, the preservation of voicing contrast for stops in initial position

[5] While absence of aspiration in the data presented here is based on the auditory judgement of the author alone, first results of an acoustic analysis of obstruents in the variety of Meran indicate that aspiration is indeed absent at least in the Tyrolean varieties (ongoing project with Barbara Vogt, University of Trieste and Alessandro Vietti, University of Bozen/Bolzano).

and a ban against voiced obstruents following short vowels in medial position. Let us consider each context in turn.

Devoicing of syllable final obstruents is widespread through German dialects and is also attested in all Germanic varieties considered here. The following is an example of final devoicing in the Cimbrian of Giazza (see also Costanzi 2012)[6]:

(3) Final devoicing (Cimbrian, Giazza)

	voiced		voiceless	
/b/ --> [p]	traiban	*'to chase away, inf.'*	traip	*'to chase away, imp.'*
/d/ --> [t]	reidan	*'to speak, inf.'*	reit	*'to speak, inf., imp.'*
/g/ --> [k]	ta:ge	*'day, pl.'*	tak^{x}	*'day, sg.'*
/v/ --> [f]	ri:van	*'to stop inf.'*	rif	*'to stop imp.'*
/z/ --> [s]	hauzar	*'house pl.'*	haus	*'house sg.'*

While obstruent voicing is neutralized in final position, stops contrast with respect to voicing in syllable initial position in all Germanic varieties under investigation[7] (for fricatives, see discussion below). The following examples illustrate contrast in initial stops with examples from Mòcheno (see also Rowley 1986, Alber 2011):

(4) Contrast of initial stops (Mòcheno, variety of Palai)

/p/ ~ /b/	pe:zn̩	*'broom'*	bolf	*'wolf'*
/t/ ~ /d/	tĩã	*'to do'*	diarn	*'girl'*
/k$^{(x)}$/ ~ /g/	k^{x}ua	*'cow'*	go:bl̩	*'pitch fork'*

Word-medially, between sonorants we observe that stops have a typical distribution observed in many Germanic varieties: while syllables consisting of a long vowel or closed in a consonant can be followed by either voiced or voiceless stops (for the distribution of fricatives in this context, see below), short vowels are followed only by voiceless stops. In other words, word-medially after heavy syllables we find contrast in voicing, but after light syllables

[6] We are dealing here with final devoicing and not e.g. with presonorant voicing, since voiceless obstruents are attested in word-medial context, as witnessed by the data in (5) and (7), which have cognates also in the Cimbrian of Giazza.

[7] The only exception to this generalization is the neutralization of initial /p/ and /b/ to [p] in Tyrolean, the remainder of a historical process of changing initial voiced stops into their voiceless equivalents.

obstruents are neutralized to their voiceless value. This pattern is illustrated in the following table with data from Cimbrian (Roana):

(5) Word-medial distribution of stops (Cimbrian, Roana)

V: T	mu:tar	*'mother'*
V: D	le:dar	*'leather'*
V T	hypeʃ	*'good'*
*V D	----	-----

A similar distribution of obstruents can be observed in Standard German, where voicing contrasts in obstruents are common after heavy syllables (e.g. *Leiter* ‚ladder', vs. *leider* ‚unfortunately'), but rare after light syllables (e.g. *Widder* ‚ram', Wiese 1996: 36). The explanation for this distribution follows work by van Oostendorp 2003 (but see also Giegerich 1992: 171 f. for a similar proposal for English). It crucially involves the metrical principle requiring that stressed syllables should be heavy:

(6) Stress-to-Weight-Principle (SWP): Stressed syllables are heavy[8]

The Germanic core lexicon is mostly mono- or bisyllabic and stress typically falls on the first of two syllables (see Golston&Wiese 1998 for German). In monosyllables, the SWP is obeyed, since Germanic monosyllabic words are of the CVV or CVC type. In bisyllables, the SWP will be obeyed if the first syllable, bearing stress, contains a long vowel or is closed in a consonant. If, however, the stressed syllable contains a short vowel, the syllable has to acquire the status of a heavy syllable in order to obey the SWP. This can be achieved by closing the syllable with the help of the following consonant. In fact, consonants following short stressed vowels in Germanic languages are often analyzed as amibsyllabic (see Wiese 1996 for German) or long (see van Oostendorp 2003 for Dutch dialects). I assume that the same is happening in the Germanic varieties examined here[9]: consonants following a light syllable are lengthened in order to make the preceding syllable heavy. If obstruents fol-

[8] See Gouskova (2003:90) for extensive discussion of definition, effects and the literature concerning this constraint known also as Prokosch's Law; see van Oostendorp 2003 for an application of Prokosch's Law to Dutch dialects.

[9] Since it is not clear whether obstruents after short vowels have to be considered long or ambisillabic in the varieties under investigation, in what follows I will assume them to be long, without excluding in principle an ambisyllabic analysis.

lowing a short vowel are lengthened, why can they not be voiced? The reason for the restriction to voiceless obstruents after short vowels lies in the markedness of voiced obstruent geminates. As Hayes&Steriade (2004: 6f.) point out, voiced obstruent geminates are marked from an articulatory point of view, because of the additional effort required for their production. Voicing requires constant airflow through the glottis, but airflow is blocked at some point of the oral cavity, in the case of obstruents. Thus, in the case of obstruents, the oral cavity has to be expanded actively in some way in order to maintain the airflow, but this expansion cannot be continued indefinitely, nor controlled tightly (Hayes&Steriade 2004: 7). Furthermore, voiced obstruent geminates are marked typologically in the sense that the presence of voiced obstruent geminates in the inventory of a language implies the presence of voiceless obstruent geminates, but not vice versa (e.g. Japanese, Itô&Mester 1995: 819). Finally, also from a formal point of view, voiced obstruents can be considered as marked. In a system adopting e.g. a privative feature [voice], a voiced obstruent will have a more marked structure than its voiceless (default) equivalent and voiced obstruent geminates will thus be more marked than voiceless geminates[10]. The Germanic languages of Northern Italy avoid marked structures of this type. They may make use of long consonants after short vowels, in order to comply with the SWP, but in this case, obstruents will never be voiced.

Summarizing, the Germanic varieties of the area under investigation share neutralization of voicing contrasts in final contexts, while stops contrast in voicing in initial position, in all varieties. Word-medially, a restriction against voiced obstruents following a short vowel can be observed. This restriction can be explained by the necessity to close a stressed, light syllable, in order to make it heavy, which, in turn, exludes voiced obstruents from this position since voiced geminates are marked universally.

3.2. *Microvariation*

In Mòcheno and Cimbrian (Lusern), a process of intersonorant fricative voicing (ISV) can be observed in word-medial position. This process has not been found in the Cimbrian varieties of Giazza and Roana, nor in Tyrolean.

In Mòcheno and Cimbrian (Lusern), fricatives are voiced between sonorants, if the preceding (stressed) syllable is heavy, i.e. contains a long vowel

[10] Also in a system contemplating binary features for [voice] a voiced obstruent will be more marked because containing the marked specification [+voice].

or is closed by a consonant (ex. (7) a-c and f-h below). Stops are not voiced in this context, they continue to display contrastive voicing (see above). After short vowels, fricatives are always voiceless, in accordance with the general distribution of obstruents after light syllables, outlined above. As a result, we find complementary distribution of fricative voicing in word-medial contexts:

(7) Complementary distribution of fricative voicing in intersonorant context: Mòcheno and Cimbrian (Lusérn)[11]

	Mòcheno		Cimbrian (Lusern)	
after heavy syllables: voiced (ISV)	a. ʃlo:vn̩	*'to sleep'*	f. tra:ven	*'beam, pl.'*
	b. bɛrvn̩	*'to throw'*	g. hɛlvɐn	*'to help'*
	c. bi:zn̩	*'meadow'*	h. di:zɐr	*'this'*
after light syllables: voiceless	d. lefl̩	*'spoon'*	i. ʃafɐn	*'to order'*
	e. bɪsn̩	*'to know'*	j. basɐr	*'water'*

The process of intersonorant voicing has roots in the history of German varieties. For Old High German (OHG) and Middle High German (MHG), Paul (1881 [2007]: 122, 154f.) describes a process of presonorant voicing of fricatives under the name of *Althochdeutsche Spirantenschwächung,* which has mostly be undone in New High German (NHG). This process can be observed clearly for the labial fricative, written as <v>, and therefore presumably pronounced as [v], both initially before vowels and intervocalically, in words such as *velt* (NHG *Feld,* ‚field',) or in alternations as *hof, hoves* (NHG *Hof, Hofes,* ‚court', nom./gen. sg.), *wolf, wolves* (NHG *Wolf, Wolfes,* ‚wolf', nom./gen. sg.). Paul assumes that both labial and alveolar fricatives underwent a process of voicing, in a first stage in intersonorant contexts word-medially, then, more generally, in presonorant contexts, extending voicing also to word-initial fricatives before a sonorant. However, as Paul observes, the process did not lead to complementary distribution of voiced and voiceless fricatives in MHG, since it was not extended to the new fricatives entering the system through the High German Consonant Shift, which generated voiceless fricatives from historical stops (p > f, t > s). Thus, in MHG voiced [v] in *prüeven* ‚to check' contrasts with ‚new' voiceless [f] in *ruofen* ‚to call' (Paul 1881 [2007]: 120). Since the process of presonorant voicing remained incomplete,

[11] If we compare the Mòcheno and Cimbrian examples above with their Standard German cognates it is clear that Standard German preserves voiceless fricatives in this context while in Mòcheno and Cimbrian they have undergone a process of voicing, e.g. *ʃlo:vn̩* vs. *ʃla:fən, bɛrvn̩* vs. *vɛʀfən, hɛlvɐn* vs. *hɛlfən*.

it cannot be observed as a productive process in NHG any more, the only remainder of it being the realization of the alveolar fricative as voiced word-initially, before vowels (as in *[zain]* 'to be', *[zɔnə]* 'sun', etc.).

Mòcheno and Cimbrian (Lusern), on the other hand, have preserved effects of OHG/MHG presonorant voicing and have extended it both to "old" and "new" fricatives, as e.g. in words such as *[ʃlo:vn̩]* 'to sleep', where historical [p] is realized as [v]. In one sense, therefore, these varieties are conservative, in that they preserve the effects of a process which has been undone in NHG (and, more importantly, in neighboring dialects, such as the Tyrolean dialects, but see van Oostendorp 2003 for similar phenomena in Dutch dialects). On the other hand, Mòcheno and Cimbrian (Lusern) exhibit here also an innovation: voicing is not limited to fricatives present in the system before the High German Consonant shift, but has been generalized to the fricative system as a whole[12]. Innovation, however, takes place along a track which was set already in older stages of the language.

In OHG and MHG, fricative voicing also targeted word-initial fricatives preceding a vowel or a sonorant. This must have been true also for the Northern Italian language islands of Mòcheno and Cimbrian (Lusern), as well as for the Cimbrian varieties of Giazza and Roana, which do not exhibit general intersonorant fricative voicing. Consider the following comparison between the realization of initial fricatives in these varieties and their modern German cognates:

(8) Effects of historical presonorant voicing in the core part of the lexicon

	Word-initial fricatives	German cognate	
Mòcheno	viʃ zun	fiʃ zɔnə	*'fish'* *'sun'*
Cimbrian (Lusern)	varbe za:ge	faʁbə ze:gə	*'color'* *'saw'*
Cimbrian (Giazza)	vuatar ziçal	futɐ ziçəl	*'food for animals'* *'sickle'*
Cimbrian (Roana)	---[13] zumar	zɔmɐ	*'summer'*

[12] This is true for labial and alveolar fricatives; the postalveolar fricative [ʃ] is realized as voiceless in all contexts.

[13] All items with initial (Standard German) [f] that we did elicit for the Cimbrian of Roana, have initial [b] (e.g. [ba:damo], Standard German *Faden*, 'thread'). However, Schweizer's 2012 [1954] maps contain for the area around Roana several lexical items with initial [v] for Standard German [f], as e.g. *vennan* for Standard German *finden*, 'to find' (Schweizer 2012 [1954]: 319).

However, it is doubtful whether word-initial voicing is still productive even in the varieties that display the process of intersonorant voicing word-medially. Arguments against productive fricative voicing in word-initial contexts come from loanwords which are integrated phonologically and morphologically into the native system. They often preserve initial [f, s], even when they are nativized otherwise. Thus, the most recent Mòcheno dictionary counts 21 entries under <f>, most of them loanwords, (s kloaʿ be.be, 2009), but among them also some native words (e.g. *fèttn,* 'fat'*).* None of the entries is indicated as a loanword, a clear sign that they are integrated into the language. For Cimbrian (Lusern), Tyroller (2003: 40, 42) mentions Romance loanwords with initial voiceless fricatives such as *[furbɐt]* 'clever', *[sitʃå:ro]* 'sink'. In the Cimbrian of Giazza, Costanzi (2012: 76) finds the loanword *[servír:rn]* 'to serve', integrated morphologically, and for the Cimbrian of Roana we have recorded *[sikel]* 'bucket' and *[sorka]*[14] 'bush', all with an initial voiceless fricative.

Secondly, as Tyroller (2003: 40) notes for the Cimbrian of Giazza, historical [pf] is often simplified to [f] word-initially and hence forms a source for voiceless [f] in this context. He mentions the example *[fan]* 'pan' (German *Pfanne*) and in our data we find *[faifan]* 'to whistle' (German *pfeifen*), for the Cimbrian of Roana.

Finally, if we were to assume a productive process of word-initial fricative voicing, we would have to assume a rather implausible typological configuration for the Cimbrian varieties of Giazza and Roana. These would then be languages with word-medial contrast but neutralization to voiced in initial contexts, a rather unusual configuration in the languages of the world, where preservation of medial contrasts usually implies preservation of initial contrasts (Beckman 1996, Lombardi 1999)[15]. I therefore assume that the large number of initial voiced fricatives in the language island varieties is a relic of the historical process of presonorant fricative voicing, but cannot

[14] Given by Schweizer still with postalveolar [ʃ], cf. Schweizer (2012 [1954]: 231).

[15] Preservation of contrast in prominent positions (alongside reduction in non-prominent positions) involves word-initial syllables and stressed syllables, or, in the case of vowels, also word-final positions (Barnes 2006, Walker 2011). Smith (2005) and Walker (2011) show that cases of neutralization in a prominent position are best understood as enhancement of perceptual prominence (as e.g. in fortition) or augmentation of the prominent position (as e.g. in metaphony). If we were to consider word-initial voicing as productive in the Cimbrian of Giazza and Roana, we would therefore have to interpret it as a process enhancing perceptual prominence. But as Smith (2005) shows, in this case we would expect neutralization to a (less sonorant) voiceless consonant, not to a voiced consonant. Neutralization to the value [voice] in prominent position is not described in the literature, to my knowledge.

be considered to be productive, today. In this sense, these varieties are similar to Modern Standard German, where word-initial alveolar fricatives preceding a vowel are realized as voiced in the native lexicon, but contrast can arise with the introduction of loanwords, as the following minimal pair shows:

(9) Potential for word-initial /s/~/z/ contrast in Modern Standard German
native: zɛks 'six' ~ loan: sɛks 'sex'

The following table summarizes the distribution of voiced and voiceless obstruents in the Germanic varieties of the area under investigation.

(10) Distribution of obstruents in Germanic varieties

	Initial stops	Initial frics	Medial stops		Medial fricatives		Final
			after H	after L	after H	after L	
Mòcheno, Cimbrian (Lu)	contrast	pot. contrast	contrast	vcless	voiced	vcless	voiceless
Cimbrian (Gia, Ro)	contrast	pot. contrast	contrast	vcless	contrast	vcless	voiceless
Tyrolean	contrast	contrast[16]	contrast	vcless	contrast	vcless	voiceless
Explanations				SWP	ISV	SWP	FD

H= heavy syllable, L=light syllable, SWP = Stress-to-Weight-Principle, ISV = intersonorant voicing; FD = final devoicing.

The table shows that in initial position obstruents either clearly contrast (for stops), or at least have the potential for contrast (for fricatives). In final position, all varieties exhibit final devoicing of obstruents. Furthermore, all varieties obey the stress-to-weight principle and hence ban the occurrence of voiced obstruents after light syllables. This last feature, as well as the presence of final devoicing can be considered typical Germanic traits of the languages under examination. Microvariation arises word-medially, where Mòcheno and Cimbrian (Lusern) display a process of intersonorant voicing of fricatives after heavy syllables while the other varieties contrast voiced and voiceless obstruents in this position. It has been shown that this process of intersonorant voicing can be traced back to OHG and MHG and, since it has disappeared in neighboring varieties, can be interpreted as a conservative feature of the languages involved. However, intersonorant voicing in Mòcheno and Cimbrian (Lusern) has also some innovative features in that, differently from the historical process, it is extended to all labial and alveolar fricatives.

[16] Voicing contrast in fricatives is limited to /f/ ~ /v/, in Tyrolean, [z] has disappeared from the inventory completely, as in many other Bavarian dialects.

In sum, the distribution of voice in obstruents in the Germanic varieties under consideration shows a high degree of conformity to Germanic patterns (SWP, FD), but also, in specific contexts, signs of conservativity (ISV) and innovation (generalization of ISV). Furthermore, inside the Germanic frame there is space for microvariation with respect to the distribution of fricatives in intersonorant contexts.

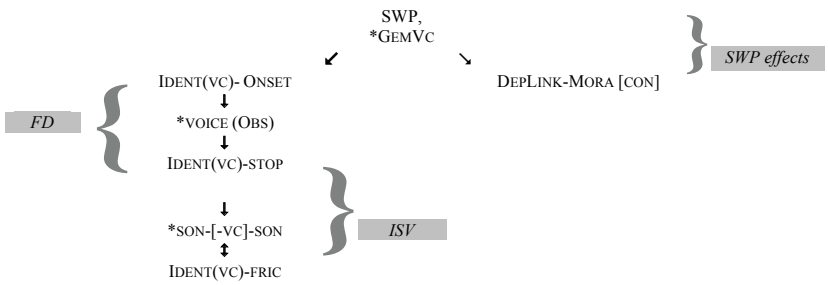
4. *Analysis*

In this section, an analysis of the distribution of voiced and voiceless obstruents is given which shows that for the Germanic varieties under investigation we can assume a core grammar accounting for SWP effects and final devoicing, which are common to all varieties. Within this core grammar, there are two constraints (*SON-[-VC]-SON, a markedness constraint against voiceless segments in intersonorant context and IDENT(VC)-FRIC, requiring faithful realization of the voicing specifications of fricatives) which, through minimal reranking, generate the observed microvariation pattern between varieties with respect to intersonorant voicing. Microvariation, therefore, is not only minimal concerning the described data, but it is also minimal in terms of constraint reranking in the grammar determining the surface data.

The following ranking diagram anticipates the results of the analysis below.There is a region of high-ranked constraints which contains the constraint SWP, requiring stressed syllables to be heavy, *GEMVC, disfavoring voiced obstruent geminates and DEPLINK-MORA[CON], a faithfulness constraint militating against the addition of moras which are not present in the input (Morén 1999: 163). The ranking configuration of these constraints, which leads to lengthening of a voiceless consonant in order to make the preceding syllable heavy, is responsible for the SWP effects observable in all Germanic varieties. Another group of high-ranked constraints consists of IDENT(VC)- ONSET, requiring faithfulness to voice in onset position, *VOICE (OBS), a markedness constraint against voiced obstruents and IDENT(VC)-STOP, requiring faithfulness to input voice for stops. Together with low-ranked IDENT(VC)-FRIC, favoring faithfulness to input voice in fricatives, the ranking of these constraints generates final devoicing in obstruents. The low-ranked group of constraints *SON-[-VC]-SON, requiring intersonorant obstruents to be voiced and IDENT(VC)-FRIC, the faithfulness

constraint favoring identity of voice in fricatives, are responsible for intersonorant voicing in fricatives if *SON-[-VC]-SON is dominant and for absence of intersonorant voicing if IDENT(VC)-FRIC is dominant.

(11) Overview grammar: distribution of voiced and voiceless obstruents in Germanic varieties[17]



The following analysis will first show how final devoicing is modeled by this grammar, then explain how the SWP effects come about and, finally, account for microvariation in the domain of intersonorant voicing.

For neutralization of obstruent voicing in final position, I adopt the proposal in Lombardi (1999) assuming that final devoicing can be interpreted as preservation of voicing contrasts in prominent, initial positions accompanied by neutralization to an unmarked value in non-prominent positions (see also Beckman 1996). The constraints responsible for final devoicing are the following:

(12) Constraints responsible for final devoicing[18]

IDENT(VC): Corresponding segments agree in voicing
IDENT (VC)-ONSET: Onset segments and their input correspondents agree in voicing.
*VOICE (OBS): obstruents must not be voiced

[17] In this diagram, arrows indicate the domination relation between constraints. The double-headed arrow links the two constraints which, through reranking, are responsible for microvariation.

[18] Although constraints of the IDENT type are used here, following Lombardi 1999, the analysis remains agnostic with respect of the interpretation of [voice] as a binary or a privative feature. Selection of one or the other approach does not change the essence of the analysis.

IDENT(VC) is a faithfulness constraint referring in general to the correspondence of input and output with respect to the feature [voice]. Below it will be shown that the constraint eventually will have to be split into IDENT(VC)-STOP and IDENT(VC)-FRIC, referring to preservation of the value for voice in stops and fricatives, respectively.

In a language displaying final devoicing, the general markedness constraint *VOICE (OBS) dominates the general faithfulness constraint IDENT(VC), leading to devoicing of final consonants in codas (candidate c. vs. d. below). However, *VOICE (OBS) does not have any influence on syllable initial positions, since these are protected by the special faithfulness constraint IDENT (VC)-ONSET, requiring voicing contrasts to be preserved in syllable-initial positions (candidate a. vs. b, below):

(13) Final devoicing

	IDENT (VC)-ONSET	*VOICE (OBS)	IDENT(VC)
/traiban/			
☞ a. trai.ban		*	
b. trai.pan	*!		*
/traib/			
c. traib		*!	
☞ d. traip			*

SWP-effects arise when the following constraints are at play (see also van Oostendorp 2003):

(14) Constraints responsible for SWP-effects

SWP:	Stress-to-Weight-Principle: stressed syllables are heavy
*GEMVC	no voiced obstruent geminates[19]
DEPLINK-MORA (CON):	do not add a mora to a consonant that it did not have underlyingly (Morén 1999:163)

[19] *GEMVC should be seen as a cover term for a more complex constraint configuaration where markedness constraints against moraic voiced obstruents dominate faithfulness constraints preserving moras associated to voiced obstruents (see the discussion of Japanese geminates in Morén 1999: 122)

(15) SWP-effects after short vowels

/hybeʃ/[20]	SWP	*GemVc	Ident(vc)-Onset	DepLink-Mora[con]
☞ a. hýp.peʃ			*	*
b. hý.beʃ	*!			
c. hý.peʃ	*!		*	
d. hýb.beʃ		*!		*

When the initial, stressed syllable contains a short vowel, it cannot satisfy the SWP by itself (candidates b. and c.). One option to make the stressed syllable heavy is to close it with a consonant which is provided by lengthening the onset consonant of the following syllable. I follow Morén (1999) in assuming that addition of weight of this type has to be analyzed as violation of the faithfulness constraint DepLink-Mora[con], which is violated whenever a mora is added to a consonant which underlyingly is not moraic (candidates a. and d.)[21]. When the consonant is lengthened, it has to be voiceless, since voiced obstruent geminates violate the constraint *GemVc (candidate d.). Selection of candidate a. thus guarantees observation of the SWP and of *GemVc, at the cost of violating faithfulness to the voicing value in the onset and faithfulness to input length. As a result, only long, voiceless obstruents can be realized after a short, stressed vowel.

Intersonorant voicing of fricatives occurs in Mòcheno and Cimbrian (Lusern), where *son-[-vc]-son, a constraint prohibiting voiceless obstruents in a sonorant context dominates the constraint requiring faithfulness to input voice for fricatives. Since intersonorant voicing occurs only for fricatives, but not for stops, we have to conclude that faithfulness is split into high-ranked faithfulness to voice in stops and lower-ranked faithfulness to voice in fricatives[22]:

[20] Since contrast is neutralized in this context, we do not know what the underlying specification might be. By the richness-of-the-base hypothesis (Prince&Smolensky 1993 [2004]), we have to assume that it could be either voiceless /p/ or voiced /b/. Since it is crucial that an underlying /b/ be realized as [p], in this context, we will show the derivation only for underlying /b/. The same consideration can be made for underlying consonant length: in principle, the underlying form could also be /hybbeʃ/. It is crucial, however, that even an underlyingly short consonant can emerge as long.

[21] Other means to make a CV-syllable heavy would be to lengthen the vowel (see Morén 1999 for discussion of cases of this type). This strategy is not available in the varieties under discussion, therefore we must assume that a faithfulness constraint preserving the input length of vowels (i.e. DepLink-Mora[voc]) is ranked above the SWP, in the languages at stake.

[22] One reviewer points out that an alternative path of analysis would be to split the markedness constraint referring to intersonorant voicing into a markedness constraint targeting stops and a markedness constraint targeting fricatives (e.g. *son-[-vcStop]-son >> Ident (voice) >> *son-[-vcFric]-son). An argument in favor of splitting the faithfulness constraints would come from pro-

(16) Constraints responsible for intersonorant voicing of fricatives

*SON-[-VC]-SON:	Obstruents between sonorants are voiced
IDENT(VC)-STOP:	Corresponding stops agree in voicing
IDENT(VC)-FRIC:	Corresponding fricatives agree in voicing

(17) Intersonorant voicing of fricatives in Mòcheno and Cimbrian (Lusern)

/ʃlo:fn/[23]	IDENT(VC)-STOP	*SON-[-VC]-SON	IDENT(VC)-FRIC
☞ a. ʃlo:.vn̩			*
b. ʃlo:.fn̩		*!	
/muatər/			
c. mua.dər	*!		
☞ d. mua.tər		*	

In the case of an input fricative, candidate a. is selected since it contains a voiced fricative between sonorants, thus satisfying *SON-[-VC]-SON. Stops cannot be voiced in this context (candidate c.), since they have to remain faithful to their input value for voicing, due to high-ranked IDENT(VC) - STOP.

In those varieties where fricatives are not voiced between sonorants, we have to assume that *SON-[-VC]-SON is ranked below IDENT(VC) - FRIC. Thus neither stops nor fricatives are voiced between sonorants, in these varieties:

(18) No intersonorant voicing of fricatives in Cimbrian (Giazza, Roana), Tyrolean

/ʃlo:fn̩/	IDENT(VC) - STOP	IDENT(VC) - FRIC	*SON-[-VC]-SON
a. ʃlo:.vn̩		*!	
☞ b. ʃlo:.fn̩			*
/muatər			
a. mua.dər	*!		
☞ b. mua.tər			*

cesses other than intersonorant voicing leading to different faithfulness behavior according to the stop-fricative distinction. On the other hand splitting markedness would entail a, presumably, universal markedness hierarchy of the type *SON-[-VCSTOP]-SON >> *SON-[-VCFRIC]-SON, stating that stops are voiced less easily, intervocalically, than fricatives. Since I do not have knowledge of phenomena of the first type nor evidence for the latter, I have to leave this issue for further research.

[23] The input, in this case, could also be / ʃlo:vn/, but, as in the previous tableau, it is crucial that even if the input was /ʃlo:fn/, it would emerge as [ʃlo:vn] from the grammar.

Putting together the partial hierarchies responsible for final devoicing, SWP-effects and intersonorant voicing, the grammar for the distribution of voiced and voiceless obstruents is constructed as in (11). This grammar features a Germanic core, which includes constraints generating final devoicing and SWP-effects, and a deeply embedded partial ranking responsible for microvariation, which, depending on the ranking between *SON-[-VC]-SON and IDENT(VC) - FRIC, leads to intersonorant voicing of fricatives or its absence. Microvariation therefore can be modeled as minimal constraint reranking between a markedness and a faithfulness constraint inside a common grammar, arguably a desirable result of the analysis.

5. *Comparison of the Germanic and the Romance obstruent system*

5.1. *The Romance contact varieties*

Voicing contrast in obstruents is attested word-initially (column a., below) and word-medially (column b., below) for all Romance varieties under investigation, the only exception being alveolar sibilants in Regional Northern Italian (RNI) which appear as voiceless [s] initially (*sale,* ‚salt'), before a vowel, and as voiced [z] between sonorants (*kaza,* ‚house'). As a matter of fact, RNI differs therefore both from the local Romance dialects and from Standard Italian, in that alveolar sibilants have a complementary distribution. Obstruents do not appear word-finally (column c.), or, more generally, in the coda of a syllable in the Romance varieties spoken in the Veneto (Veronese and Vicentino) and in RNI[24]. An obstruent coda is allowed in the Romance varieties of the Trentino where obstruents appear as voiceless in this position, i.e. they undergo a process of final devoicing similar to that observed for the Germanic varieties (e.g. *fredi* vs. *fret*, ‚cold, m.pl. and m.sg.):

[24] An exception to this restriction are the alveolar fricatives [s, z], which can be interpreted as occupying a coda position in words such as *pasta, asma* (see Nespor 1993 for arguments). However, sibilants are assimilated in voicing to the following consonants, in this context.

(19) The obstruent system of the Romance contact varieties

	a. W-initially		b. W-medially		c. W-finally	
Trentino	pasár ~ bazár tɔr ~ dar kaza ~ gat fɛn ~ vɛn sal ~ za	*'pass ~ kiss'* *'take ~ give'* *'house ~ cat'* *'hay ~ come'* *'salt ~ already'*	dɔpo ~ gɔbo mati ~ nadi paka ~ tega bafi ~ fevɛr kasa ~ kaza	*'after ~ hunchback'* *'mad ~ born'* *'slap ~ blow'* *'moustache ~ fever'* *'hunt ~ house'*	--- fredi → fret lɔngi → lɔnk novi → nof buzi → bus	*'cold, m.pl. ~ sg.'* *'long, m.pl. ~ sg.'* *'new, m.pl. ~ sg.'* *'hole, pl. ~ sg.'*
Veronese	pasá ~ bazá tazi ~ dato kato ~ gato foja ~ voja sɔto ~ zo	*'pass ~ kissed'* *'do not talk ~ given* *'find, 1p.sg. ~ cat'* *'leaf ~ desire'* *'lame ~ down'*	kopá ~ robá dotór ~ odór tɔko ~ togo stɔfa ~ nova fasól ~ fazól	*'killed ~ stolen'* *'doctor ~ smell'* *'piece ~ take 1p.sg.'* *'fabric ~ new f.sg.'* *'napkin ~ bean'*	--- --- --- --- --- --	
Vicentino	pasare ~ bazare tɔla ~ dɔna kato ~ gato foja ~ voja suto ~ zo	*'pass ~ kiss'* *'table ~ woman'* *'find 1p.sg. ~ cat'* *'dry ~ down'*	kopare ~ gɔbo dotore ~ odore tɔko ~ togo stofa ~ nɔva pese ~ caza	*'kill ~ hunchbacked'* *'doctor ~ smell'* *'piece ~ take, 1p.sg.'* *'fabric ~ new, f.sg.'* *'fish ~ house'*	--- --- --- --- --- ---	
RNI	passa ~ bacio tiro ~ dire kara ~ gara fino ~ vino sale	*'pass, 3p.sg. ~ kiss'* *'pull, 1p.sg. ~ say'* *'dear f.sg. ~ contest'* *'fine m.sg. ~ wine'* *'salt'*	rapa ~ rɔba sete ~ lɔde muko ~ mugo tifo ~ vivo kaza	*'turnip ~ stuff'* *'thirst ~ praise'* *'phlegm ~ dwarf pine'* *'support ~ alive'* *'house'*	--- --- --- --- --- ---	
Pattern	**contrast except RNI [s]**		**contrast except RNI [z]**		**FD in TN**	

5.2. *Contact induced change?*

In establishing whether similarities in the phonological system of Germanic and Romance varieties can be intepreted as contact induced change I will assume a restrictive position, maintaning that we can be sure that change is contact induced only if (a) similarities between varieties did not exist before they came in contact, (b) change can not be attributed to system internal factors such as markedness and (c) change is clearly tied to the contact situation (see Alber, Rabanus & Tomaselli 2012 for discussion of these points, see Thomason&Kaufman 1988, Thomason 2011 for less restrictive positions). The only structural similarity in the obstruent system attested both for Germanic and Romance varieties which probably is not pre-existing to the contact situation, is the process of final devoicing found in the Germanic varieties of the area and in the Italian dialects of Trentino. However, as is argued in Alber, Rabanus&Tomaselli (2012), final devoicing in Trentino dialects can be interpreted as a development of unmarked structures after historical vowel apocope.

Final devoicing is a typologically unmarked process: many unrelated languages allow only for voiceless obstruents in the coda, but no language exhibits final voicing (Kiparsky 2008, contra Blevins 2006). Furthermore, neutralization of the voicing value of obstruents to unvoiced in final position

emerges as an unmarked structure in L1 acquisition (Kiparsky 2008) and L2 acquisition (Wang 1995, Broselow, Chen&Wang 1998). Finally, voicing contrast in final position is argued to be marked with respect to perception, because of the lack of the necesssary acoustic cues in final position (Steriade 2009).

Since final devoicing creates unmarked structures, it may have arisen in Trentino dialects because of language internal triggers, and need not be interpreted as a contact phenomeno[25]. Furthermore, as Alber, Rabanus & Tomaselli (2012) point out, final devoicing structures are not limited to the geographical area where Romance varieties are in contact with Germanic varieties, but appear also in dialects of the Emilia Romagna or Southern Italian dialects where contact can be excluded as a trigger (see also Rohlfs 1966: §300-302).

6. *Conclusions*

The Germanic varieties of Mòcheno, Cimbrian and Tyrolean, spoken by language minorities in the Southern Central Alps exhibit a high degree of similarity to patterns observed in other Germanic varieties with respect to the distribution of obstruent voice. Obstruents contrast in voicing word-initially and are neutralized to voiceless word-finally. Word-medially, effects of the stress-to-weight principle can be observed in that stressed heavy syllables can be followed by voiced and voiceless obstruents, but stressed light syllables can be followed only by voiceless obstruents. It is argued here, following van Oostendorp 2003, that in this context obstruents are long, in order to close the preceding syllable and thus make it heavy. Since voiced obstruent geminates are marked universally, obstruents have to be voiceless, in this context.

The Germanic varieties of the area exhibit also a certain degree of microvariation with respect to a process of intersonorant voicing of fricatives. This process is a conservative feature of the languages that display it (Mòcheno and Cimbrian, Lusern), which was active in older stages of the history of German, but has been undone in New High German. In Mòcheno and Cimbrian (Lusern), not only have the effects of the process been preserved,

[25] We can of course not *exclude* that contact has played some role in the emergence of final devoicing in Trentino varieties. However, it is practically impossibile to detect the influence of contact in a process which may have arisen for independent reasons.

but they have also been generalized to all fricatives, including those emerging from the High German Consonant Shift. In this sense, these language island varieties are therefore innovative, although innovation procedes on a pre-designed track.

Intersonorant voicing is not observed productively in the Cimbrian of Giazza and Roana, nor in Tyrolean. Microvariation between these varieties and Mòcheno and Cimbrian (Lusern) on the other hand, can be modeled as minimal re-ranking of two constraints in a Germanic core-grammar.

The Romance varieties of the area exhibit voicing contrasts in obstruents word-initially and word-medially (with the exception of /s/ in Regional Northern Italian, where voiced and voiceless allophones are in complementary distribution). In word-final contexts, varieties not subject to historical vowel apocope (Veronese and Vicentino) do not allow for obstruents. The Trentino varieties, on the other hand, allow for final obstruents, which in this context undergo final devoicing. Although the process of final devoicing resembles closely the same process observed in Germanic varieties, it need not be contact-induced since, as is argued in Alber, Rabanus & Tomaselli (2012), final devoicing is attested also for Romance varieties outside language contact and, more generally, generates unmarked structures which can arise independently from language contact.

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