

On Obstruent Voicing in Breton, German, and Italian[★]

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1 Introduction

In this paper, I investigate seemingly unrelated occurrences of obstruent voicing in derived environments in three different languages: Breton, German, and Italian. In the Breton dialect spoken on Île de Groix, underlyingly voiceless obstruents are realised as voiced when they are followed by a vowel-, or sonorant-initial word (1a). Since they do not surface as voiced when followed by a vowel-initial affix (1b), this instance of voicing cannot be explained as intervocalic or intersonorant voicing.¹

(1) Île de Groix Breton:

- a. [ʃùg əzáj]! 'Sit down there!'
b. [ʃùk-ed əzáj]! 'Sit down (you.plural) there!' [Ternes 1970:45]

In certain varieties of German, where intervocalic voicing is not operative either, root-final underlyingly voiceless obstruents (2a) surface as voiced when followed by a vowel-initial clitic (2b). Voicing does not occur in Standard German pronunciation (2c).

(2) German:

- a. wi[s]en 'to know' b. wei[z]ich 'I know' c. wei[s]ich 'I know'

The Italian case is slightly more complicated. Word-internally, *s* is either voiced intervocalically or realised as a geminate (3a,b). There are some instances where intervocalic voicing does not apply, as with a vocalic prefix and an *s*-initial stem (3c). In almost the same environment, the final *s* of the prefix *dis-* is subject to intervocalic voicing (3d). In connection with a consonant-initial stem, the same prefix surfaces with the voicing specification of the following obstruent (3e,f).

(3) Italian:

- a. ca[z]a 'house' d. di[z]-onesto 'dishonest'
b. ca[s:]a 'cash register' e. di[sp]iacere 'displeasure'
c. a-[s]ociale 'asocial' f. di[zg]razia 'misfortune'

This paper aims at giving a unified account of the voicing patterns found in the three languages. I will argue in particular that this voicing effect is closely tied to the alignment of morphological and prosodic categories. That is, the left stem

edge and the left edge of the prosodic word have to coincide in all three languages. If this cannot be warranted, the occurring mismatch is 'marked' by voicing. I build on earlier work here (Krämer 2000), where a detailed account of voicing alternations in Île de Groix Breton within the framework of Correspondence Theory (McCarthy & Prince 1995) is provided. The German data have not yet been analysed in a constraint-based framework. Kleinhenz (1998) has given a rule-based analysis, which in its essentials is parallel to the analysis of Sanskrit final voicing by Selkirk (1980). Both proposals, however, do not recognise the crucial role of syllabification in the process under discussion, as will be shown in section 4. The Italian data are used in Kenstowicz (1995) to illustrate his notion of Base-Output Identity. The validity of output-output correspondence analyses of phonological phenomena has already been convincingly questioned by Hale, Kisser & Rice (1998). In this paper, I will argue that an output-output analysis is not compatible with the Italian facts, since there are data which clearly contradict this approach. Instead, the final voicing phenomena in all three languages can be adequately described in a strictly input-output oriented model of Correspondence Theory.

The paper is structured as follows. In section 2, the Breton data will be examined in greater detail and the analysis of Krämer (2000) will be discussed. The Italian data will be looked at more closely in section 3. In section 3.1 I will show the inadequacies of an output-output approach, and in section 3.2, the alternative account, which was originally developed for Breton, will be applied to Italian. Section 4 deals with German and shows the parallels between this language and the other two. Section 5 concludes.

2 Breton final voicing and Local Conjunction

Île de Groix Breton has a phonemic distinction between voiced and voiceless obstruents, as illustrated in (4). Furthermore, word- or syllable-final obstruents are devoiced (5). The language also displays voicing assimilation between adjacent obstruents (see Krämer 2000).

(4) Voice distinction in Île de Groix Breton:

<i>pout</i>	'pot'	<i>bout</i>	'bunch of heather'	[Ternes 1970:4f]
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(5) Final devoicing:

	singular	plural		singular	plural	
a.	<i>pout</i>	<i>poudew</i>	'pot'	<i>grek</i>	<i>grekew</i>	'cafetière' [Ternes 1970]

As mentioned in the introduction, word-final obstruents are realised as voiced when followed by a vowel-initial word (1b, 6). Vowel-initial affixes do not trigger voicing in preceding obstruents (1b).

(6) Voicing of obstruents in Île de Groix Breton:

tap + *ar-ivi:n* → *tab ar-ivi:n*

tap, hit PREP-trap/mouth

'Hit him on the mouth!/ Beat the shit out of him!'

According to Ternes (1970:66f), the syllabic position of intervocalic obstruents cannot be determined strictly. This observation also holds in word juncture contexts. Following Ternes, I assume that even at word junctures intervocalic obstruents are ambisyllabic. Such a syllabification satisfies the need for a consonantal onset for each syllable, as well as the bias against epenthesis. In OT terms, these universal tendencies are formalised as the constraints in (7) and (8), respectively.

(7) ONSET: Syllables have a consonantal onset.

(8) DEPIO: Dependency Input-Output: Every segment in the output has a correspondent in the input.

Breton is a suffixing language. In line with other proposals within OT (e.g. Selkirk 1995, Grijzenhout & Krämer 2000), I assume that this tendency to add affixes to the right edge of stems is an effect of the satisfaction of the Alignment constraint, given in (9). (On the notion of Alignment see McCarthy & Prince 1993.) This constraint demands that the left edge of every stem coincide with the left edge of a prosodic word. Prefixation with incorporation of the affix into one prosodic word with the stem would violate this constraint.

(9) ALIGNLeft(stem, PWD): The left edge of every stem coincides with the left edge of a prosodic word. (Peperkamp 1994, Grijzenhout & Krämer 2000)
(ALIGNL)

Word-final obstruents which are syllabified into the following prosodic word violate ALIGNL. Consequently, ONSET and DEPIO must be ranked higher than ALIGNL. The question remains why these obstruents surface as voiced even when they are underlyingly voiceless. Grijzenhout & Joppen (1998) found that in language acquisition children go through a stage where they voice onset obstruents, while the reverse (onset devoicing) does not happen at any stage. A constraint demanding onset voicing (OV) may either be an Alignment constraint or a positional markedness constraint (as proposed by Grijzenhout & Joppen

1998). Additional typological arguments for such a constraint can be found in Krämer (2000).

(10) OV: ALIGNLeft(σ , [+voice]): 'Syllables start with a voiced segment.'
(Grijzenhout & Joppen 1998)

The combination of both Alignment constraints in a Local Conjunction (Smolensky 1993, Lubowicz 1999) yields the following complex constraint.

(11) Local Conjunction (**A&OV**): ALIGNL(stem, PWd) & OV {ALIGNLeft(σ , [+voice])}; Local domain = segment.²

Such a local conjunction is violated whenever one segment within a representation violates both constraints. A word-final obstruent which is in the onset of the following prosodic word violates ALIGNL, because it is located between the left prosodic word edge and the left stem edge of this word. It additionally violates the second part of the conjunction (OV) if it is voiceless. An obstruent escapes violation of the local conjunction if it satisfies at least one of the two constraints, no matter which one. To get the desired effect of onset voicing, the syllable wellformedness constraint ONSET, the constraint against epenthesis DEPIO, as well as the local conjunction A&OV have to rank higher than input-output faithfulness. The relevant IO-Faithfulness constraint is given in (12b). Thus, demands of syllabification (having an onset) exclude the possibility to escape from a violation of A&OV by satisfying ALIGNL(stem, pwd). The only choice that remains is satisfaction of OV.

(12) a. IDENT[voice] (ID): Obstruents in the output have the same feature specification for [voice] as in the input.

b. IDENTONSET[voice] (IDONS): Obstruents which are in onset position in the output have the same feature specification for [voice] as in the input.
(Lombardi 1999)

Lombardi (1999) shows that in interaction with the simple markedness constraint which prohibits voiced obstruents (13), the positional faithfulness constraint in (12b) accounts for final devoicing.

(13) *[+voice]: Avoid voiced obstruents.

In (14), the preceding ranking argument for Breton is summarised.

(14) Ranking for Breton:

DEP, ONSET, **A&OV** >> IDONS, ALIGNL >> OV >> *[+voice]

Tableau (15) illustrates how this grammar (14) accounts for obstruent voicing in Breton. Candidate (a) has epenthesised a consonant (indicated by □) to satisfy high ranking ONSET. This epenthesis fatally violates high ranking DEPIO. Candidate (b) avoids this violation on the cost of violating ONSET. In this candidate the left prosodic word boundary is perfectly aligned with the left stem edge of the second word. Candidate (c) satisfies ONSET and DEPIO. It has parsed both words into one prosodic word. This yields one violation for each segment between the left prosodic word edge and the left edge of the stem /əzaj/. Additionally, the first onset of the second prosodic word violates OV (the constraint on onset voicing). Both violations together yield a violation of the local conjunction of the two alignment constraints (A&OV). The only candidates which are better than this one with regard to the local conjunction as well as the other two top ranked constraints are (d) and (f).³ Both avoid violation of A&OV by voicing the segment in question, notwithstanding violations of lower ranking identity constraints. Finally, candidate (f) is chosen, because it has less violations of ALIGNL, since it has generated two overlapping prosodic words instead of one for both stems.

(15) [ʃugəzaj] 'sit down there!'

/ʃuk/ + /əzaj/	DEPIO	ONS	A&OV	IDONS	ALIGNL	OV	*[+voice]
a. (ʃuk)(□#ə.zaj)	*!				*	*	*
b. (ʃuk).(#ə.zaj)		*!				*	*
c. (ʃu.k#ə.zaj)			*!		***	**	*
d. (ʃu.g#ə.zaj)				*	**!*	*	**
e. (ʃu(ḱ)#ə.zaj)			*!		*	**	*
☞ f. (ʃu(ḡ)#ə.zaj)				*	*	*	**

() = prosodic word boundaries; # = stem boundary

The form in tableau (16) is evaluated to demonstrate that with this grammar, voicing is not expected in forms with a vowel-initial affix. In these forms the context for onset voicing is simply not given, thus the local conjunction A&OV is vacuously satisfied.

(16) [ʃuket] 'sit down you all!'

/ʃuk + et/	DEPIO	ONS	A&OV	IDONS	ALIGNL	OV	*[+voice]
☞ a. (ʃu.ket)						**	
b. (ʃu.get)				*!		*	*
c. (ʒu.get)				*!*			**

With this background I will now proceed to Italian and show the similarities to Breton with respect to onset voicing.

3 Italian

In intervocalic position, the short strident *s* is always pronounced as voiced in Northern Italian (17a-d).⁴ With clitics and at word margins, *s* always surfaces as voiceless (17e,f and g,h respectively).

(17) Italian *s*-voicing:

- | | | | |
|--------------|--------------------|--------------------|----------------------------|
| a. a[z]ola | 'buttonhole' | e. lo [s]apevo | 'I knew it' |
| b. a[z]ilo | 'nursery school' | f. telefonati#[s]i | 'having called each other' |
| c. ca[z]a | 'house' | g. [s]apore | 'taste' (noun) |
| d. ca[z]-ina | 'house' diminutive | h. ga[s] | 'gas' |

Nespor & Vogel (1986) concluded from these data that the rule of intervocalic *s*-voicing is restricted to the domain of the prosodic word. This view has been questioned by Kenstowicz (1995). His account will be discussed in the following subsection.

3.1 Italian *s*-voicing and faithfulness to the base

The generalisation made by Nespor & Vogel is contradicted by data containing prefixes. With a vocalic prefix, stem-initial stridents remain voiceless in some cases (18a). With a prefix ending in a strident, intervocalic *s*-voicing applies (18c).

(18) Intervocalic *s*-voicing and prefixes

- | | | | |
|------------------|----------------------|-----------------|-----------------------|
| a. a-[s]ociale | 'asocial' | c. di[z]-onesto | 'dishonest' |
| bi-[s]essuale | 'bisexual' | di[z]-uguale | 'unequal' |
| ri-[s]uonare | 'to ring again' | bi[z]-unto | 'greasy, dirty' |
| pre-[s]entire | 'to hear in advance' | d. bi[s-k]ugino | 'second grade cousin' |
| b. re-[z]istenza | 'resistance' | di[s-p]iacere | 'displeasure' |

Are some prefixes incorporated into the prosodic word (18b,c), while others are not (18a), as proposed by Peperkamp (1994)?

Basing himself on these data, Kenstowicz (1995) assumes that intervocalic *s*-voicing is not restricted to the prosodic word and that the discrepancies in (18) result from output-output correspondence. The constraint on intervocalic *s*-voicing *VsV is valid for all forms, but the forms in (18a) do not display voicing, because they are faithful to the simplex output form of the stems contained in these morphologically complex forms. This simplex output form is called the 'base'. The constraint demanding faithfulness to a simplex base is labelled Base-Identity in the tableaux in (19, 20), which illustrate Kenstowicz' proposal. In (19), Base-Identity is vacuous because the prefix *dis-* has no independently

occurring form. As a consequence, no base is available and the candidate is chosen that satisfies best the constraint *VsV, which prohibits voiceless stridents between vowels.

(19)	/dis + onesto/	Base-Identity	*VsV
☞ a.	di[z]-onesto		
b.	di[s]-onesto		*!
	no base: *dis		

In (20), there is a base containing the strident. In this base *s* is voiceless. Satisfaction of *VsV via voicing leads to a violation of Base-Identity.

(20)	/a + sociale/	Base-Identity	*VsV
☞ a.	a-[s]ociale		*
b.	a-[z]ociale	*!	
	base: sociale		

In forms like *re[z]istenza* (18b), Base-Identity is vacuous again, because there is no independent word **[s]istenza* in Italian to which this constraint might refer.

A closer look at Italian reveals some difficulties for this approach. First, there are some prefixed forms in which *s*-voicing is not blocked even though they have a simplex base with a voiceless *s* (21a). Second, in some compounds stridents are voiced even though they have a simplex base containing a voiceless strident (21b). Third, the *s* in the clitic *si* is not voiced even though in intervocalic position. This clitic always occurs with a phonological host, so there is no independent base which could block *s*-voicing (21c).

(21) Italian OO problems:

- | | | | |
|----|--|--------------------|--------------------------------------|
| a. | pre[z]upposizione
'presupposition' | *pre[s]upposizione | base: [s]upposizione
'assumption' |
| b. | ga[z]olio
'diesel' | *ga[s]olio | bases: ga[s] + olio
'gas' + 'oil' |
| c. | telefonati[s]i
'having called each other' | *telefonati[z]i | no independent base: *[s]i |

The solution for forms like (21a,b) would be a morpheme-specific reranking of Base-Identity and *VsV. For these words *VsV would have to be ranked higher than Base-Identity.

Next to these empirical problems the Base-Output account has the shortcoming that it does not adequately describe the role of syllabification and the role of prosodic-morphological mapping, as will be shown immediately below.

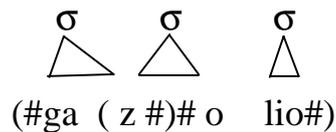
3.2 Italian *s*-voicing as an effect of Local Conjunction

The fact that stridents in clitics are voiceless in Italian, and that clitics do not influence stress assignment are good arguments for the two following generalisations: (i.) Clitics do not belong to the prosodic word (Peperkamp 1997); and (ii.) the constraint demanding *s*-voicing is limited to exactly this domain, as was assumed by Nespor & Vogel (1986). Therefore, I propose the following constraint.

(22) $*(VsV)_{\text{PwD}}$: 'Intervocalic *s* is bad within a Prosodic Word.'

In a compound like *gasolio* 'diesel', the final *s* of the first compound member *gas* is syllabified as the onset of the second stem *olio* 'oil'. This is a mismatch in the alignment of morphological and prosodic structure as was observed already in Breton. This is illustrated in (23).

(23) Mismatch of morphological and phonological structure:



Italian does not exhibit productive consonant epenthesis even though vowel epenthesis is rather common. As an effect of a highly ranking constraint against epenthesis (i.e., DEPIO), vowel-initial stems remain onsetless in surface representations (e.g., *olio* 'oil'). To account for this fact as well as the syllabification in (23), ONSET has to rank rather highly but below DEPIO.

Italian is a suffixing language by and large. I therefore conclude that ALIGNL(stem, pwd) plays a relatively important role in Italian. A highly ranking ALIGNL prefers a form where the two members of a compound are parsed into two prosodic words (as in 23) to one consisting of only one prosodic word for both stems. To account for the syllabification of *s* in (23), which violates ALIGNL, this constraint has to be ranked below both, DEPIO and ONSET. The voicing of the *s*, which is not in intervocalic position within one prosodic word here satisfies the local conjunction which was responsible for onset voicing in Breton as well, A&OV. Recall that A&OV is violated whenever one segment violates both ALIGNL(stem, pwd) as well as OV [ALIGNL{ σ , [+voice]}]. Voicing of *s* in *ga[z]olio* ignores faithfulness to voice, as does intervocalic *s*-voicing, so IDENT[voice] has to rank rather low in the hierarchy. The preceding ranking argument is summarised in (24).

(24) Ranking for Italian:

DEPIO >> ONSET >> A&OV >> ALIGNL, $*(VsV)_{\text{PwD}}$ >> ID[voice] >> OV

In tableau (25) *gasolio* is evaluated by the grammar that was established so far.

(25) Italian 'diesel' as an effect of LC

/gas/ + olio/	DEPIO	ONS	A&OV	ALIGNL	*(VsV) _{PWd}	ID	OV
a. gas.(□#olio	*!		(*)	*			(*)
b. gas.(#olio		*!					
c. gaz.(#olio		*!				*	
d. ga.(s#olio			*!	*			*
☞ e. ga.(z#olio				*		*	

Other problematic cases like *pre[z]upposizione* can be treated as lexicalised under this account.

(26) Lexicalised *pre[z]upposizione*: /presupposizione/ (/s/ subject to *(VsV)_{PWd}) instead of /pre + supposizione/ with base [s]upposizione 'assumption'

In forms like *di[z]-onesto* the *s* of the prefix *dis-* is not voiced because it is in intervocalic position within a prosodic word. Recall that high ranking ALIGNL demands that prefixes do not belong to the same prosodic word as the stem they are attached to. Rather, the reason for voicing is again the local conjunction A&OV in combination with syllable wellformedness (ONSET). This is illustrated in (27i). The lack of voicing in a word like *a-[s]ociale* falls out automatically. The prefix is not part of the prosodic word. Instead, it may be adjoined to the prosodic word or be parsed in the phonological phrase. This means that the *s* of the stem *sociale* is not in intervocalic position for the *s*-voicing constraint *(VsV)_{PWd}. Moreover, the left stem edge and the left prosodic word edge are perfectly aligned, neither ALIGNL nor A&OV are violated. Low ranking IDENT[voice] decides for the most faithful candidate in this case. See tableau (27ii)

(27) Italian without OO-Faithfulness

i. /dis+onesto/	DEPIO	ONS	A&OV	ALIGNL	*(VsV) _{PWd}	ID	OV
a. dis.(□#onesto	*!		*	*			*
b. dis.(#onesto		*!					
c. (di.s#onesto			*!	***	*		*
d. di.(s#onesto			*!	*			*
☞ e. di.(z#onesto				*		*	

ii. /a+sotʃale/	DEPIO	ONS	A&OV	ALIGNL	*(VsV) _{PWd}	ID	OV
a. a#s.(otʃale		*!	*	*			
b. a#z.(otʃale		*!		*		*	
c. a.(#zotʃale						*!	
☞ d. a.(#sotʃale							*

Under the assumption that prefixes do not belong to the prosodic word it is not the lack of voicing in forms like *a[s]ociale* that has to be explained (as it is aimed at by Kenstowicz), but the occurrence of voicing without the context of prosodic-word-internal intervocalic *s*-voicing in forms like *di[z]onesto* or *ga[z]olio*. This was accounted for by the same assumptions as for final voicing in Breton. In the following I will show that the same mechanisms play their part in German cliticisation as well.

4 German cliticisation

Standard German displays final devoicing, as well as glottal stop insertion with vowel-initial pronouns, as illustrated in (28).

(28) Standard German: /hab + ɪç/ → **hap ʔɪç** 'I have'

In informal Standard German, such pronouns are parsed into one prosodic word with the preceding verb (Hall 1999). A diagnostic for this is the syllabification of the last consonant of the stem as the onset of the vowel-initial pronoun.

(29) Prosodic structure of vowel initial function words (Hall 1999)

- a. Encliticized: (kommt es)_ω *((komt)_ω es)_φ [kɔm.təs] 'is it coming'
 b. Free: (komme)_ω ich *((komme ich)_ω [kɔmə ʔɪç] 'am I coming'

In Colloquial German⁵ this cliticisation is found as well, but this variety additionally displays voicing of underlyingly voiceless obstruents in this environment. Examples (30c,e) show that the stem-final obstruent of these verbs is underlyingly voiceless. In connection with a vowel-initial enclitic, however, these obstruents are realised as voiced (30d,f). (30g) shows that, in contrast to Breton, vowel-initial major categories, forming a prosodic word of their own, do not attract the preceding final consonant as their onset.

(30) The "[vaɪzɪçnɪç]-effect" in Colloquial German:

- a. /hab + ən/ → ha.**b**ən 'to have' b. /hab + ɪç/ → ha**b**ɪç 'I have'
 c. /vis + ən/ → vis**ə**n 'to know' d. /vais + ɪç/ → va**ɪ**zɪç 'I know'
 e. /ʃtɔp + ən/ → ʃtɔp**ə**n 'to stop' f. /ʃtɔp + ɪç/ → ʃtɔ**b**ɪç 'I stop'
 g. /ʃtɔp/+ Anja → ʃtɔp ʔ**a**nja 'stop Anja'

Kleinhenz (1998) tried to capture this instance of voicing in a derived environment with the rule in (31).

(31) Kleinhenz' (1998:166) intervocalic voicing rule:

[+obstr] → [+voice] / V ___)_{PWd} V...)_{PWd}

This rule has two major problems. First, Kleinhenz has to assume that in case of cliticisation one prosodic word is nested within another. Second, this rule neither states anything about the syllabification of the affected elements, nor about the motivation for this operation (i.e. resyllabification and voicing). In the account developed here, by contrast, voicing of the stem-final consonant occurs because this consonant is stuck between a left prosodic word edge and the left stem edge contained in this prosodic word. It is, so to say, the marking of a morpho-prosodic mismatch, as was the case in Breton and Italian as well.

I do not attempt to give a complete account of cliticisation. For the present purpose it is sufficient to assume that cliticisation occurs as a result of the interaction of the following two constraints (32, 33) with ALIGNLeft(stem, prosodic word).

(32) PARSE: Morphemes have to be incorporated into prosodic structure in surface representations.

(33) DEPSTRUC: Prosodic structure in the output has correspondent structure in the input.

If DEPSTRUC is ranked above ALIGNL, from an input stem plus pronoun a candidate is chosen which leaves the pronoun without higher prosodic structure, because DEPSTRUC is violated once by each prosodic word that is found in an output. If PARSE is ranked above ALIGNL as well, the clitic is incorporated into the prosodic word of the preceding morphological word. This will be illustrated in more detail below.

The grammar that accounts for the fact of final voicing in German looks as follows: ONSET has to rank above DEPIO, because glottal stop epenthesis is quite common. Since glottal stops are also inserted at the left word margin, ONSET has to rank higher than ALIGNL as well. That German is a suffixing language with a highly autonomous status of prefixes and particles shows that ALIGNL must be rather important. DEPSTRUC is promoted over ALIGNL in the registers or varieties where cliticisation occurs. This constraint militates against the creation of a prosodic word for elements which can also be parsed within the prosodic word of another lexical element. Finally, the local conjunction A&OV ranks above IDONS, so that voicing is preferred to nonvoicing in case ALIGNL is violated for reasons of syllable wellformedness.

(34) Ranking for German: ⁶

PARSE >> DEPSTRUC, ONS >> A&OV >> IDONS, ALIGNL >> DEPIO, OV

A form displaying final voicing in Colloquial German is evaluated in tableau (35). All forms which do not parse the clitic into a prosodic word are doomed for violating highly ranked PARSE. Double violation of DEPSTRUC rules out the Standard German form. The remaining two candidates tie on the latter constraint. The winner is chosen by the local conjunction of ALIGNL and OV. High ranking ONSET as well as DEPSTRUC prevent satisfaction of ALIGNL. So the only way to escape from a A&OV violation is by satisfaction of the otherwise low ranking OV constraint, i.e. by voicing the first onset of the underlyingly vowel-initial pronoun.

(35) Obstruent Voicing in Colloquial German ⁷

/vais + Iç/	PARSE	DEP STRUC	ONS	A& OV	ID ONS	ALIGN L	DEP IO	OV
SG a. (vais).(ʔ#Iç)		**!		*		*	*	*
b. vais#Iç	*!					**		
c. (vais).ʔ#Iç	*!	*		*		*	*	*
d. (vais).#Iç	*!	*	*			*		
e. (vai).s#Iç	*!	*		*		*		*
f. (vai).z#Iç	*!				*	*		
ISG g. (vai.s#Iç)		*		*!		***		*
☞ h. (vai.z#Iç)		*			*	***		

Final voicing is not as apparent in German as it is in Île de Groix Breton. The phenomenon is obscured sometimes for morphological reasons. Look at (36a). In this example, the bold-faced *s* should be voiced according to the analysis given above, because it is in final position in the morphological word /kan-st/ (here reduced to [kans]), and it is "misused" as the onset of the following pronoun /du/, which is reduced to schwa. Thus, *s* intervenes between the left edge of the pronoun and its left prosodic edge.

(36) No onset voicing with second person enclitic:

- a. [dat kans^{**s**}ə zo maxn] Das kannst du so machen. 'You can do it this way.'
- b. [dat kanz^{**z**}ə zo maxn] Das kann sie so machen. 'She can do it this way.'

In such a case, the morphological information of second person is in danger of being not identifiable. The form in (36b) is exactly what would happen if final voicing succeeded. The only interpretation for this form is third person feminine. The underlyingly salient information about person (i.e., 2.sg) were not mapped into the surface structure in (36b) if its input were that of (36a). In OT

terms, this is a violation of a morphological MAX constraint, which I abbreviate as MAX_{morph} in the tableau below. In order to block final voicing in the right environment, this constraint has to rank above the local conjunction which prefers voiced onsets in case of morpho-prosodic misalignment.

(37) Colloquial German *kansə* 'can you'

	MAX_{morph}	A&OV
☞ a. <i>kansə</i>		*
b. <i>kanzə</i>	*! (3fem. vs. 2.p)	

I close the discussion of German with this issue and move on to the conclusion.

5 Conclusion

Each of the three investigated languages exhibits particular restrictions on the morphological environment where obstruent voicing applies. Italian displays voicing with stridents in prefixes before vowel-initial stems but not with stem-initial stridents following the vowel of a prefix, voicing happens neither with postverbal enclitics. Breton has obstruent voicing in word-word juncture, and in German voicing is observed with vowel-initial pronominal enclitics, but not with prefixes or words. Despite the differences between these languages, it was possible to account for these phenomena with largely the same set of constraints and even approximately the same ranking for all three languages. The core idea behind the analysis is that voicing occurs where a prominent morphological position is not mapped to the corresponding prominent prosodic position. In all three languages this mismatch occurs in satisfaction of constraints on syllable structure. Thus, phonology (in this case, proper syllabification without epenthesis) is regarded more important than morphological alignment in the grammars of these languages, and voicing is the price that is paid for disregarding constraints on the morphology-prosody interface.

With regard to earlier accounts it was argued that the rule-based as well as the constraint-based approaches (Selkirk 1980, Kleinhenz 1998, and Kenstowicz 1996, respectively) provide no adequate generalisations.

If any Output-Output correspondence constraint were at work in the investigated languages, we would expect the opposite effect than final voicing in Breton and German (both displaying final devoicing): the devoicing of obstruents in onset position at a word or stem juncture. In output-output correspondence, an additional correspondence relation of complex forms with their respective simplex form is assumed. The simplex form of any consonant-final stem in Breton as well as in German involves a voiceless final obstruent due to

final devoicing. This devoicing, then, would be protected by O-O faithfulness in the complex form where a vowel-initial word attracts the final consonant of the preceding word to get an onset for its first syllable.

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¹ Exactly the same pattern as in Breton is also found in Sanskrit (Selkirk 1980). Since the phenomena are so intriguingly parallel in both languages, I assume that the analysis for Breton also holds for Sanskrit.

² In Lubowicz' (1999) theory of derived environment effects, these effects are triggered by local conjunctions of faithfulness with markedness constraints. The current proposal fits in Lubowicz' account if the conjoints of the local conjunction are reformulated as Anchoring (McCarthy & Prince 1995) and markedness, respectively.

³ Even though between round brackets, the *k/g* in candidates (e,f) does not constitute a prosodic word of its own, but is prosodified in both prosodic words of which the two candidates consist.

⁴ I will restrict myself to an analysis of Northern Italian here, since (a) my informant stems from Lombardia, and (b) for Standard Italian the situation is a little bit confusing. Speakers from the Toscana (like Bertinetto for instance) claim that there is no word-internal intervocalic *s*-voicing in Standard Italian, but voicing with *s*-final prefixes is regular (see Bertinetto 2000).

⁵ What is labelled 'Colloquial German' in the following is a variety located in the Rhineland area (see also Heike 1964, Kleinhenz 1998).

⁶ To account for the lack of syllabification over word boundaries in German (cf. 30g), an additional highly ranked constraint like ALIGNL(Lex, pwd) has to be assumed. The variable *Lex* stands for major lexical categories (i.e., nouns, verbs, adjectives). High ranking of this constraint excludes syllabification over word boundaries as found in Breton, but not in Colloquial German. For reasons of space and since this paper focuses on certain similarities between these languages rather than the differences, I will not go into this issue here.

⁷ The abbreviations SG and ISG in the left column of the tableau stand for 'Standard German' and 'Informal Standard German', respectively. They indicate the candidate which is the winner with the given input in the respective variety. These candidates become optimal by demotion of the bold-faced constraints. In the ISG grammar, A&OV is demoted below IDONS. In addition to this, DEPSTRUC is demoted below ALIGNL in the SG grammar.