THE PHONOLOGY AND PHONETICS OF OBSTRUENTIZATION

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1. Introduction

There is no such thing as a synchronic phonological process or rule of obstruentization. I would like to defend this unorthodox claim below by referring to some paradoxes inherent in the traditional approaches to phonology, as well as to some modern assumptions on what phonology is and how it relates to phonetics. In this paper, I will use a concrete example of *w*-obstruentization, which is a diachronic fact in some Slavic languages in that the historical labio-velar glide [w] became a labio-dental fricative [v], which in turn may become a voiceless [f] in devoicing contexts. In most modern analyses of the phenomenon called Progressive Voice Assimilation in Polish (e.g., *listewek* [lʲistɛ**v**ɛk] 'board, gen.pl.dim.' ~ *listwa* [lʲist**f**a] 'board, nom.sg.'), it is assumed that the fricative exhibiting the [v ~ f] alternation is an underlying sonorant /w/ which is obstruentized in the course of synchronic derivation.

One paradox concerning traditional phonological approaches is observed in how segments characterized as [+sonorant] or [–sonorant] are affected by universal default rules concerning their [±voice] specification. On the one hand, the following default rules are postulated, which have a solid phonetic grounding (cf. Halle and Stevens 1971; Rubach 1996).

(1)   a. Sonorant Default
          [+sonorant] → [+voice]

       b. Voice Default
          [–sonorant] → [–voice]

In short, the two feature fill-in rules provide voice properties at the end of derivation or derivational cycles to those segments which either underlyingly or due to operation of phonological processes are not specified for

voice. The existence of such rules makes it superfluous to mark sonorants for [voice] at the underlying representation and allows for analyses in which the phonologically inert sonorant voicing can be correlated with the absence of laryngeal specification, or in fact, with the stage of derivation in which that specification has not yet been supplied by the default rules. The choice is really this. Either we refer to the laryngeal underspecification of [+sonorant] segments with the consequence of rule ordering, or we fully specify sonorants and arbitrarily treat the category [voice] that they hold as behaving differently from the one lodged in obstruents. Neither choice is satisfactory.

On the other hand, it is observed that a typical outcome of obstruentization of sonorants, e.g., glide hardening, is a voiced obstruent, unless voicelessness is contextually effected (e.g., Kenstowicz 1994: 497).

(2)   Obstruentization and voicing
        [+sonorant]   → [–sonorant]
                              |
                          [+voice]

The outcome of the obstruentization rule contradicts the universal defaults in (1) in that [–sonorant] becomes [+voice] rather than [–voice]. The obvious solution to this problem, and one which does not need to violate underspecification, is to resort to ordering the Sonorant Default (1a) before the obstruentization rule in (2), as in, e.g., Rubach (1996). The effect illustrated in (2) is particularly problematic for theoretical models such as the Element Theory of Government Phonology (GP), which does not supply any voicing specification to sonorants at any point of derivation, and reject extrinsic rule ordering (e.g., Kaye, Lowenstamm and Vergnaud 1985, 1990).

In this paper, I follow GP and assume that sonorants remain non-specified throughout the derivation arguing that such a strict phonological model has the advantage of explaining rather than describing the effects of so called obstruentization. In particular, I will show that Obstruentization cannot be a synchronic process, while Progressive Voice Assimilation (PVA) cannot be a phonological process in modern Polish.

2. Data and analyses

2.1. *w*-strengthening in Slavic

Earlier Proto-Slavic and probably Proto-Indo-European [w] is reflected in modern Slavic languages as [w, v, f] depending on the language and pho-

nological context (e.g., Sussex and Cubberley 2006: 144; Cyran, in press). To be more precise, there are systems in which the labio-velar glide [w] is still found in all positions (dialectal Ukrainian, Sorbian). We will refer to this group as representing stage A in the development of the earlier [w]. Stage B is represented by Standard Ukrainian and Slovak. In these systems, we observe [v] in prosodically strong positions (pre-vocalic) and [w] in weak ones, leading to alternations [v ~ w], e.g., [ɫavɔk ~ ɫawka]. Stage C is represented by, for example, Polish, in which [v] alternates with [f] in the same positions, but additionally also in the PVA context, e.g., [tfuj].

(3)

	A		B		C	
	Dialectal Ukrainian	*Standard Ukrainian*	*Standard Slovak*	*Standard Czech*	*Standard Polish*	
	[**w**ɔda]	[**v**ɔda]	[**v**ɔda]	[**v**ɔda]	[**v**ɔda]	'water'
	[t**w**ij]	[t**v**ij]	[t**v**ɔj]	[t**v**u:j]	[t**f**uj]	'your'
	[sli**w**]	[sli**w**]	[slɔ**w**]	[slɔ**f**]	[swu**f**]	'word, gen.pl.'
	[ɫa**w**ka]	[ɫa**w**ka]	[la:**w**ka]	[la:**f**ka]	[wa**f**ka]	'bench'

[w] ⟶ [w ~ v] ⟶ [v ~ f]

Clearly, the systems reflect a shift from an unambiguous sonorant [w], which can be found in Sorbian and some dialectal forms of Ukrainian (A), to an unambiguously(?) obstruental [v], which alternates with [f] (C). Between these two stages there are systems in which [v] alternates with the glide. The ambiguity of [v] in Slavic languages (and not only Slavic[1]) is an empirical fact that has to be somehow accounted for. However, this ambiguity in fact spans both B and C systems and is almost exclusively connected with the behaviour of [v] with respect to voicing, as shown below.

(4)
   a. initial /v/ in Russian does not trigger voice assimilation of the preceding obstruent across word boundaries as do other voiced fricatives
   b. the word-internal /v/ in /Tv/ in Czech and dialectal Polish does not trigger regressive voice assimilation
   c. instead, /Tv/ is subject to Progressive Voice Assimilation in Polish, but only within words

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[1] See e.g., Blaho and Bye (2005), Mołczanow (2007), Siptár (1996), Tuttle (2005, and a survey in Botma and van 't Veer (2013).

The typical solution to the above problems involves postulating that [v] is a phonological sonorant /w/ which exhibits the sonorant-like behaviour at the stages of derivation at which it has not yet been turned into an obstruent: /w/ → /v/. Thus, obstruentization becomes crucial in the description of the phonological behaviour of [v]'s in languages like Polish.

    Below, I argue that the exceptional behaviour of [v] in (4) is observed mainly because certain (wrong) assumptions are held about the relationship between phonetic forms and the phonological representations. I also introduce a model of interaction between phonology and phonetics which eschews some of the common assumptions and renders processes such as obstruentization impossible.

2.2. Progressive Voice Assimilation in Polish

In modern Polish Progressive Voice Assimilation (PVA) concerns two fricatives, which historically came from /w/ and the palatalized /rʲ/, respectively. Synchronically, they fall into the voiced [v], [ʒ] and voiceless [f], [ʃ] types, depending on the context. Here, we will focus only on the familiar labio-dental fricative.

(5)

Original	*Later*	*Modern Polish*	*Contextual distribution*			
			i.	*ii.*	*iii.*	*iv.*
		v	D_	_D	#_	V_V
w → v		f	T_	_T	_#	

D = voiced consonant, T = voiceless consonant, V = vowel, # = word boundary

The voiceless [f] is found in three contexts of which two are rather unproblematic. Polish has both Final Devoicing (_#) and Regressive Voice Assimilation (_T). PVA, on the other hand, is problematic because a lexical sequence /Tv/ should effect regressive rather than progressive assimilation. First let us look at some data that show the need to postulate PVA in Polish. The relevant fricative is voiced intervocalically in (6a). Given that there is no intervocalic voicing in Polish, it is commonly accepted that we are therefore dealing with Progressive Voice Assimilation (PVA) in (6b), Final Obstruent Devoicing (FOD) in (6c) and Regressive Voice Assimilation (RVA) in (6d).

(6)   a. **V_V**   b. **T_**   c. **_#**   d. **_T**

                                (PVA)   **(FOD)**   **(RVA)**

'carrot'
marchewek   *marchwi*   *marchew*   *marchewka*
[marxɛ**v**ɛk]   [marx**f**ʲi]   [marxɛ**f**]   [marxɛ**f**ka]
dim.gen.pl.   gen.s.g.   nom.sg.   dim.nom.sg.

'Orthodox church'
cerkiewek   *cerkwi*   *cerkiew*   *cerkiewka*
[tsɛrcɛ**v**ɛk]   [tsɛrk**f**ʲi]   [tsɛrcɛ**f**]   [tsɛrcɛ**f**ka]
dim.gen.pl.   gen.sg.   nom.sg.   dim.nom.sg.

'board'
listewek   *listwa*   *listw*   *listewka*
[lʲistɛ**v**ɛk]   [lʲist**f**a]   [lʲist**f**]   [lʲistɛ**f**ka]
dim.gen.pl.   nom.sg.   gen.pl.   dim.nom.pl.

Such data are usually viewed as fairly obvious, in that we are dealing with regular obstruent devoicing in (6c,d), the absence of such devoicing in (6a), and a rather peculiar twist in (6b), whereby the assumed obstruent /v/ does not trigger RVA. Instead, it itself undergoes PVA. At any rate, the phonological basis of the alternations in (6) is a voiced fricative.

Below, I list the assumptions that are typically made in relation to such voicing phenomena, which seem to thwart full understanding of obstruentization and PVA in Polish. It seems that one assumption follows from the other, leading relentlessly to a conclusion that the behaviour of the fricative can be explained only if it is assumed to be an underlying sonorant, which is later turned into an obstruent.

(7)
    a.   Friction = Obstruency
    b.   [v ~ f] is a voice alternation among obstruents
    c.   Devoicing is a phonological process
    d.   Progressive Voice Assimilation must receive a phonological (computational) account
    e.   Sonorant-like behaviour of fricatives (obstruents) suggests an obstruentization rule /w/ → /v/, /rʲ/ → /ʒ/

In my view, the above assumptions are an artefact of the type of phonological thinking which can be dubbed "what you see is what you get". Thus, phonetically observable friction leads to a postulation of a relevant

category responsible for this effect in the phonological representation. Similarly, all such voicing effects are automatically assumed to involve obstruents and must involve an operation on the category [voice], or other one used in a given system.

The intuition that the sonorant-like behaviour of the relevant fricatives is due to the fact that they are underlying sonorants does not tally well with the obstruent-like (computational) analysis of such voicing phenomena as Progressive Voice Assimilation. Obstruentization becomes a necessary computational phenomenon. Additionally, a number of processes need to be ordered. For example, in order to obtain a voiced obstruent as result of obstruentization, this process must be preceded by Sonorant Default, or its analogue. On the other hand, PVA, in its crucial part must precede and bleed RVA (Rubach 1996).

In the proposal below, I will look for an answer to the puzzles described above in the nature of obstruentization as a historical shift.

3. The proposal

3.1. Theoretical assumptions

Generally the main theoretical assumptions made in this paper are those of the Element Theory in Government Phonology (Harris 1990, 1994). The slight extension of the tenets of this theory is made in points (8d,e), which will be explained below.

(8)
  a. Strict privativity – Only monovalent features (elements) are used. Individual elements as well as their combinations are directly interpretable. Unmarked objects are and remain non-specified, rather than underspecified, e.g., obstruents which are non-specified for voice are directly interpreted as voiceless, without fill-ins or defaults.
  b. Sonorants do not have any laryngeal specification – (spontaneous voicing).
  c. Phonology defines contrasts and possible processes – Phonological processes cannot refer to non-existing properties (e.g., no reference to laryngeal specification in sonorants, no reference to properties that are not in the representation).
  d. Phonetic interpretation of phonological categories is subject to shifts – No one-to-one correspondence between phonetic categories and phonological representations.

e. The arbitrariness of the relation between phonological and phonetic categories is of the same type as that between form and function in morphemes.

Let us assume the standard set of elements (e.g., Harris 1994),[2] of which only three will be relevant to our discussion. Only the articulatory correlates of the elements are provided.

(9)   Elements

      U – labiality   (w, v, f, p, b, m)
      I – palatality   (j, C^j)
      A – coronality   (r, n, l, t, d, s, z)
      h – friction   (v, f, s, z, ʃ, x)
      ʔ – occlusion   (p, b, t, d, k, g)
      N – nasality   (m, n)
      L – voicing   (v, b, d, z, g)
      H – aspiration   (p^h, t^h, k^h)

We are now able to see how points (8a-c) above follow from the Element Theory. Phonologically, [w], which we observed in the systems at stage A in (3), is represented by the element {U} associated with a consonantal skeletal position, with no additional properties responsible for voice. On the other hand, the systems at stage C, if they do possess the full-blooded obstruental [v], represent the labio-dental voiced fricative as {U,h,L}. Given that in GP all phonological phenomena must have a local source, including a local source of elements added to an object, it is rather obvious that a shift {U} → {U,h,L} could not be a phonological process because there is no source of the extra two elements. What is possible is, for example, delinking of {L} from {U,h,L} yielding a laryngeally unspecified labial fricative {U,h}, that is [f]. One could also envisage a lenition process {U,h,L} → {U} in which two lexically present elements are lost in a prosodically weak position, but not the reverse, because element addition could occur only as a result of spreading from a local source. Given that historically the strengthening occurred, for example, word-initially, as in [wɔda] → [vɔda], no such local presence of {h} and {L} can be established. Of course, we know from data like (3) that obstruentization [w] → [v] does happen in natural languages. The question is how.

    Let us now move to (8d,e), which will allow us to understand the mechanism of the historical change that we observed in Slavic languages.

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[2] Excluding the coronality element {R} and the neutral element {@}.

(10)   The relation between phonology and phonetics

                            Phonetic interpretation
                            rules/conventions

        /   /   ⟵——————————————⟶   [   ]

        Phonological   Phonetic
        representation   categories
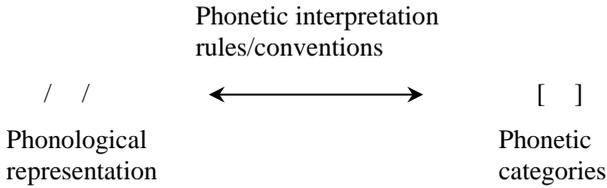
Note that the arrow symbolizing the relationship between phonetic catego-
ries and phonological representation is bidirectional. In this sense, pho-
netic interpretation is not viewed as part of derivation of a surface form
from the underlying form. It is more like a translation in the sense of
Scheer (this volume) of the information in one linguistic module to an-
other. The nature of this relationship is arbitrary in the same sense as the
relationship between phonological form and meaning in morphemes. The
arbitrariness of that relationship does not bring chaos to language acquisi-
tion of morphemes, because, for example, the concept of a four-legged
barking animal will not be associated with the form /dog/ by learners of
Polish, because the ambient language provides the phonological form
/pʲɛs/ for that concept. Thus, the relation is first established in acquisition.
Like in morphemes, the relation between phonological and phonetic cate-
gories is also established in acquisition and there is no longer a need to
derive one from the other. Since both levels are independent of each other,
it is only expected that shifts may occur, for example, in the actual pho-
netic shape of the phonetic categories, which then may or may not be
reflected in the phonological representation (phonologized), and vice
versa. There may be systemic phonological shifts – restricted by the nature
of the phonological system – which will or will not be reflected on the
surface. Both situations will be shown below to have occurred in the proc-
ess of /w/ → /v/ change.
    Let us look at the stages and steps that seem to be necessary in the
development from [w] ↔ {U} to [v] ↔ {H,h,L}.

3.2. Obstruentization

Obstruentization cannot be a synchronic phonological rule because it
would have to involve element addition in the absence of their local
source. Rather, it is a multi-step and multi-stage diachronic phenomenon
involving shifts in phonetic interpretation and respective phonologizations
of the shifts requiring at least one generation of speakers for each stage.

We begin with stage A, at which the original labio-velar glide is found in all positions.

(11)   Stage A (Sorbian and Dialectal Ukrainian)

                                All positions

    Phonetic category   [w]
                                ↑
                                │
                                ↓
    Phonological   {U}
    representation
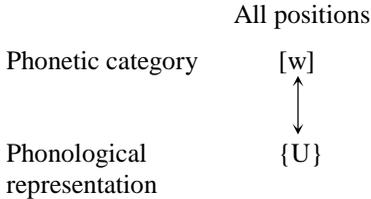
    ↔ phonetic interpretation, arbitrary relation between / / and [ ]

Step 1 in the development of [w] involves an interpretational shift result-ing in a stronger articulation of {U} in prosodically strong positions (_V) positions.

(12)   Stage B1 (after interpretational shift)

                            weak   strong
                            positions   positions
    Phonetic category   [w]   ~   [v/v]
                            ↑   ↗
                            │   ↙
                            ↓
    Phonological   {U}
    representation
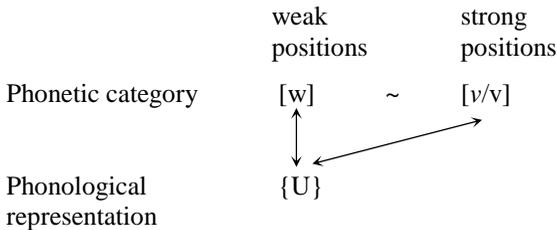
Stage B1 illustrates a system in which we observe an alternation [w ~ v], but only at the phonetic level, which can be called interpretational allo-phony. Phonologically, we are dealing with the same representation as in stage A.

    Step 2 involves phonologization of the surface alternation in that each member of the alternation receives its own representation and the relation between them is mediated by a phonological process. Thus, at stage B2, we are dealing with a phonological interpretation of the alternation as involving licensing of headedness (phonological allophony).[3]

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[3] The two representations are potentially contrastive, that is, when the process of head loss is not present in the phonological system.

(13)   Stage B2 (after phonologization of the alternation)

|	weak positions		strong positions
Phonetic category	[w]	~	[*v*/v]
	↑↓		↑↓
Phonological representation	{U}	~	{<u>U</u>}

In this system, [w] is a "derived" object. Note that the model does not allow us to assume that the direction of synchronic "derivation" could be the opposite. This is because we may lose properties in weak positions but not add them in strong ones, unlike in most generative models allowing for obstruentization. It should be noted, that on the surface systems B1 and B2 are identical, but they are very different as a whole. For example, it is not longer {U} that is the basis of the [v ~ w] alternation, but {<u>U</u>}. Thus, the types of systems we illustrated in (3) are inaccurate in the sense that they are only referring to the phonetically observed facts, and not to linguistic systems that stand behind those facts.

It seems that phonologization takes into account the type of alternation that is to be phonologically encoded. I assume that the alternation with [w] "holds back" a full reanalysis of [v] to {U,h,L} in B2. Note, that the system with [v] ↔ {<u>U</u>} is a potential candidate for the ambiguous object which sounds like an obstruent but behaves like a sonorant. It is a fricative but it does not possess laryngeal specification, therefore it will not trigger Regressive Voice Assimilation. However, Progressive Voice Assimilation is not found in type B systems either, as we saw in (3).

Step 3 involves a loss of the rule or process whereby the headed object is weakened under weak licensing {<u>U</u>}→{U}.[4] As a consequence, both the phonological object {U} and the phonetic category [w] were lost too.[5] We have entered type C of languages, or, to be more precise, stage C1, in which our [v] begins to alternate with [f].

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[4] There is some independent evidence, based on clustering of consonants, that the licensing strength of nuclei in Polish increased between the Late Common Slavic period and the modern times (Cyran 2010: 178).

[5] They reappear in present day Polish, but they are related to a completely different object, that is, [ł], which is now pronounced [w].

(14)   Stage C1 (new interpretation of {U̲} in weak positions)

|	weak positions	strong positions	weak positions
Phonetic category	[w]	[v/v] ~	[f]
Phonological representation	{U}	{U̲}	
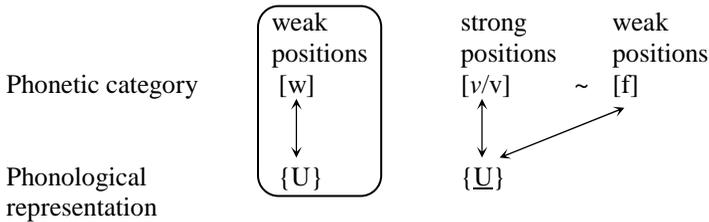
At stage C1, we are really dealing with the same phonological representation of [v] as in B2. The difference lies in the absence of weakening of that object in "codas". The change was purely phonological now – a computational component (headedness loss under weak licensing) has been lost. Now, the [v] must retain its strong articulation also in weak positions, which follows from the relation established between headedness and friction. While pre- and intervocalically, the [v] may maintain voicing, it is aerodynamically difficult to maintain voicing in voiceless environments. Thus, word-finally (_#) and in pre-obstruent position (_T) the voicing is absent. The devoicing, however, is not phonological in the sense that a category [voice], or {L} in our case, is manipulated. It is a phonetic effect. Note that the {U̲} in C1 is exactly the same phonological object as in B2, but the overall system is different. We could say that the {U̲} in C1 is even better as a candidate for the object which is found in the PVA data, because it is not only its phonological representation but also the entire system in which it functions that is compatible with the existence of such phenomena. {U̲} will be voiced in voiced environment: D_, V_V, _V, and voiceless elsewhere: T_, _T, _#.

The obvious question is why context (T_) is treated on a par with the weak "coda" contexts? Has it suddenly become prosodically weak? If so, this would be incompatible with the rest of the story of *w*-obstruentization where [w] strengthened in (T_) in systems belonging to stage B1. The answer is rather simple. We are not dealing with devoicing in weak contexts here. Recall that the strengthening of nuclei as licensers has in fact eliminated the process of head loss and the alternation [v ~ w]. What we are dealing with is a problem that some types of segments have picking up spontaneous voicing in hostile (voiceless) environments. Note that even "true" sonorants may be devoiced in Polish in some contexts, e.g., *wiatr* [vʲatr̥] 'wind', *krtań* [kr̥taɲ] 'larynx'. Some authors, e.g., Michalski (2009) explicitly claim that liquids are also devoiced precisely in the context for PVA, e.g., *krowa* [kr̥ɔva] 'cow', *tlen* [tl̥ɛn] 'oxygen'. It is only logical that

a sonorant-like [v], which is characterized by more narrowing in the vocal tract than liquids, will find it much more difficult to pick up voicing in the T_ context. I would like to claim that this is the explanation for PVA in Polish. It is a phonetic phenomenon, just as FOD in the case of {U} in C1 systems. The role of phonology in this phenomenon is reduced to just one aspect: the choice of the phonological representation of the object [v]. I would like to argue that it is {U}, and not {U,h,L}, as the latter requires another step in our story of "creeping" obstruentization, which is reiterated in (15) for convenience.

(15)   "Creeping" obstruentization

   a. Stage A: a stage with no phonetic [v,f]

       [w]   [v]   [f]
   ↕
       {U}
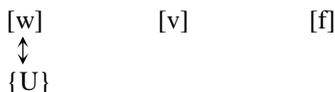
   b. Stage B1: a stage with no [f]

       [w]   ~   [v]   [f]
        ↕ ←_____↗
       {U}
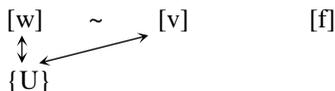
   c. Stage B2: phonological alternation [v ~ w], and still no [f]

       [w]   ~   [v]   [f]
        ↕   ↕
       {U}   ~   {U̲}
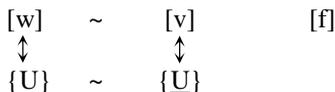
   d. Sage C1: loss of "weakening rule" interpretational shift, no [w]

       [w]   [v]   ~   [f]
                        ↕ ←_____↗
                       {U̲}
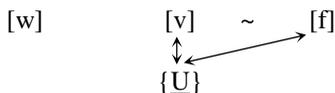
   e. Stage C2: two types of [v ~ f] in modern Polish

                    sonorant-like   ‖   obstruent-like

       [w]   [v]   ~   [f] ‖   [v]   ~   [f]
                        ↕ ←_____↗   ‖   ↕   ↕
                       {U̲}   ‖   {U,h,L}   ~   {U,h}

                    PVA forms   ‖   elsewhere
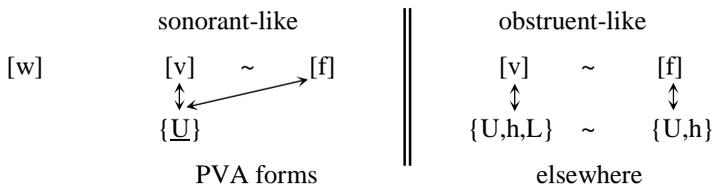
Step 4 involves full reanalysis of the sonorant-like [v] ↔ {U̱} as a truly obstruental [v] ↔ {U,h,L}, e.g., Polish *woda* [vɔda] 'water' (#_), but also *krowa* [krɔva] 'cow, nom.sg.'. It is a simple case of reanalysis of phonetically observed properties: labial, voiced, fricative [v] as {U,h,L}. It is also a case of new encoding of the voice alternation which exists independently in the obstruental system of Polish, c.f. {U,h,L} → {U,h} in *krowa* / *krów* [krɔva ~ kruf] 'cow, nom.sg./ gen.pl.' and *żaba* / *żab* [ʒaba ~ ʒap] 'frog, nom.sg./ gen.pl.'. This alternation is truly phonological.

However, as suggested in (15e), modern Polish may still have both representations of [v], that is, {U̱} and {U,h,L}. As mentioned earlier, phonological reanalysis is not just a mechanical translation of phonetic forms into corresponding phonological representations. This mechanism must also take into account the phonological behaviour of a given segment. Thus, it is as much a phonologization of a sound pattern as of a speech sound alone. I would like to claim, that the behaviour of [v] in the PVA related forms has thwarted step 4 in this context, yielding two sub-patterns: the sonorant-like one in the PVA forms – with phonetic voice alternations, and the obstruent-like one elsewhere – with truly phonological voice alternations.

There is of course an alternative analysis, in which a full phonologization affected all [v]'s in Polish. Of course, then, we would have to say that in *listwa* [lʲistfa] 'board' we are dealing with a lexically voiceless object, that is {U,h} because the surface fricative that would be phonologized as a full obstruent was voiceless in this context. At this stage, I am not convinced that this is a possible solution. One reason why it is problematic is that the voice alternation in the forms involving the PVA context, that is, e.g., in *listwa* / *listewek* [lʲistfa ~ lʲistɛvɛk] 'board, nom.sg./dim.gen.pl.' would have to be treated as accidental and the forms would in fact not be related in the lexicon. However, this problem still requires further study.

Thus, modern Polish seems to represent a hybrid system with two types of [v ~ f] alternation. It is interesting that [w], which has been "abandoned" at stage (15d) of the creeping obstruentization, has now become utilized if not "colonized" by a new relation with laterals. The former velarized, or non-palatalized variant of [l], that is, [ł] is pronounced as [w] by recent generations of Polish speakers, giving alternations of the type *mały*/ *mali* [mawɨ ~ malʲi] 'small, masc.sg./masc.pl.'. It looks like a new cycle may have been born.

6. Conclusion

Obstruentization exists but it is a multi-step and multi-stage phenomenon involving shifts in phonetic interpretation, phonologizations of these shifts, shifts in phonological computation (strengthening of licensing), etc. Therefore, it could not possibly be a synchronic process or rule of grammar. This follows from a restrictive phonological model of Element Theory which is part of Government Phonology in which the use of monovalent phonological categories (elements) restricts possible types of phonological processes.

In this paper we looked at two strictly connected phenomena: *w*-Obstruentization in Slavic languages in general, where we observe different stages of this diachronic phenomenon represented by different languages, and Progressive Voice Assimilation (PVA) in Polish. Neither phenomenon is truly phonological. While obstruentization is a complex and gradual diachronic shift, PVA is only phonetic, or interpretational at best. These conclusions are possible if we supplement the Element Theory with an additional assumption concerning the nature of the relationship between phonology proper and phonetics. Such a simple model is presented in this paper.

The assumption that the relation between phonological categories and phonetic categories is arbitrary does not render the sound system discussed here any less restrictive. The small phonological component is highly restricted in terms of allowing for a small number of formal process which are fully determined by the phonological representation and how it is organized. The phonetic side of the equation makes certain phonetic categories more likely than others in linguistic systems (e.g., Stevens 1972). The arbitrariness of the relation between the two levels or aspects of sound systems, represented as a bidirectional arrows "↔" (cf. Scheer, this volume), is in many respects the same in kind as the relationship between the phonological form and meaning in the definition of morphemes such as, e.g., *pies* [pʲɛs] 'dog' ← /pʲɛs/ ↔ 'four legged barking domestic animal'. Likewise, just as the phonological representation may change in the history of a given language, e.g., *pьsъ → /pʲɛs/, so can the phonetic exponent of a given phonological object, e.g., ([w] → [v]) ↔ {U}. This description is fully compatible with the recent views that distinctive features might in fact be emergent rather than innate (e.g., Mielke 2008).

Traditional approaches treat the relation between phonetics and phonology too literally which leads to wrong assumptions such as equating phonetic presence of friction, or voice alternations with obstruency. This, in turn, leads to a postulation of synchronic rules of obstruentization,

which are happily embraced in phonological models whose machinery is unbounded. Very often rule ordering relives the historical reality rather than expresses the synchronic state of affairs.

Finally, we are able to provide an answer to the theoretical puzzle presented at the beginning of this paper. Why obstruentization produces voiced obstruents? Not because the sonorant had [+voice], but because obstruentization is a phonological/lexical reanalysis of phonetic properties as phonological, thus we expect that a voiced object regardless of the type of laryngeal system we are dealing with.

If the model presented here is on the right track, then not only obstruentization must be reconsidered, but also such cherished concepts as Final Obstruent Devoicing, which is clearly either a misnomer or covers only a fraction of facts.

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