Hulst, H. van der (1992) On the nature of phonological primes and the structure of segments. Ms. Rijksuniversiteit te Leiden.

Iz, F. (1964) *Eski Türk edebiyatında nesir.* Istanbul: Osman Yalçın Matbaası.

Jensen, S. (1994) Is ʔ an element?: towards a non-segmental phonology. *SOAS Working Papers in Phonetics and Linguistics* 4:71-78.

Johanson, L. (1978-79) The indifference stage of Turkish suffix vocalism. *Türk Dili Araştırmaları Yıllığı - Belleten,* 151-156. Ankara: Turk Dil Kurumu Yayınları.

Kaye, J. (1990a) Government in phonology: the case of Morrocan Arabic. *The Linguistic Review* 6:131-159.

Kaye, J. (1990b) 'Coda' licensing. *Phonology* 7:301-330.

Kaye, J. (1991) Head projection and indexation: a theory of reduplication. Paper presented at the 14th GLOW Colloquium, Leiden.

Kaye, J. (1993) Post-graduate phonology seminar. London: SOAS.

Kaye J., J. Lowenstamm, and J-R. Vergnaud (1985) The internal structure of phonological elements: a theory of charm and government. *Phonology Yearbook* 2:305-328 .

Kaye J., J. Lowenstamm, and J-R. Vergnaud (1990) Constituent structure and government in phonology. *Phonology* 7:193-232.

Kenstowicz, M. (1994) *Phonology in generative grammar*. Oxford: Blackwell.

Krueger, J. (1962) *A grammar of Yakut*. Bloomington: Indiana University Press.

Lowenstamm, J. and J-F. Prunet (1988) Tigré vowel harmonies. Ms. Montréal: Université du Québec à Montréal.

Piggott, G. (1990) Empty onsets: evidence for the skeleton in phonology. Paper presented at the 13th GLOW Colloquium, Cambridge.

Ploch, S. (1993) *The vocalic system of standard German and Augsburg Swabian and rhotic effects on the internal structure of vowels*. M.A. thesis. London: SOAS.

Ploch, S. (1995) French nasal vowels — a first approach. *SOAS Working Papers in Phonetics and Linguistics* 5:91-106.

Pogany, C. (in prep.) *Topics in Hungarian phonology*. Ph.D. dissertation. London: SOAS.

Ritter, N. (1995) *The role of universal grammar in phonology: a government phonology approach to Hungarian*. Ph.D. dissertation. New York: New York University.

Schane, S. A. (1984) The fundamentals of particle phonology. *Phonology Yearbook* 1:129-156.

Walker, C. (1995) ATR-harmony as h-licensing. *SOAS Working Papers in Phonetics and Linguistics* 5:108-120.

Yavaş, M. (1980) Vowel and consonant harmony in Turkish. *Glossa* 14:189-211.

Yazıcıoğlu. *Envārü'l-Āşıkīn*. Ms. Topkapı Sarayı, Koğuşlar Kütüphanesi, number 1012. (Date of copying 1560).

The Slavic [w > v] shift:
a case for phonological strength

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This paper is a report on work in progress rather than a presentation of a complete analysis. We take up the old problem of the development of Common Slavonic (CSl) *w in various present day languages of this group, to define the reasons as well as the results of the shift by considering the changes from the perspective of phonological representation. Briefly, in Slavonic languages we find different reflexes of the historical glide [w] which range from the original glide to the labial fricatives [v] and [f], and even to [x] in North Russian. Thus the main issues which we want to consider here comprise the cause or motivation for the shift and the synchronic representation of the respective reflexes; the latter is necessary to account for their phonological behaviour. First we present the facts concerning the development of the CSl glide *w and offer some data for reference. Then the relevant aspects of the model of phonological representation used in Government Phonology (GP) are presented and the main theoretical problems are defined. This is followed by a proposal concerning the most crucial stages in the development.

1. The data

The division provided in (1), and the respective examples in (2) are based on the types of reflexes of the CSl *w in a number of modern Slavonic languages, though the grouping corresponds to the actual phonological behaviour of these objects only partially.

(1) *Development from "glide" [w] to "obstruent" [v].*[1]

A	B	C	D	E	(F)
[w]	[w/v]	[w/v/f]	[v/f]	[v/f]	[v/f/x]
E.Ukr.	St.Ukr.	St.Slovak	St.Czech	St.Polish	N.Russ.
Up.Sorb.	S.Russ.		St.Russ.	N.Mor.Czech	
				Periph.Polish	
				W.Ukr.	

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[1] One has to stress that we are not suggesting here that there was a linear development from CSl via Ukrainian to Polish, for example. Rather, the different languages reflect the respective stages in the development of CSl *w.

(2) *Distribution of [w/v/f] in* WEAK *("coda") vs.* STRONG *(before vowel) positions*.

A	B	C	D	E	(F)
(E.Ukr.)	*(St.Ukr.)*	*(St.Slovak)*	*(St.Czech)*	*(St.Polish)*	*(N.Russ.)*
w**ɔ**da	v**ɔ**da	v**ɔ**da	v**ɔ**da	v**ɔ**da	vʌda
t**w**ij	t**v**ij	t**v**oj	t**v**u:j	t**f**uj	
wpasty	**w**pasty	**f**padnu:c	**f**padnɔwt	**f**paść	
sli**w**	sli**w**	slɔ**w**	slɔ**f**	swu**f**	słɔ**x**
ła**w**ka	ła**w**ka	la:**w**ka	la:**f**ka	wa**f**ka	ła**x**kə

In (2) we refer to the concept of phonological strength. This distinction can be straightforwardly defined in terms of prosodicity, i.e. the prosodic position of the segments in question. Quite uncontroversially, the strong position is identified with the beginning of the word or the syllable, i.e. the prevocalic position as in the case of, for example, the first consonant in Standard Ukrainian [vɔda] *voda* 'water, nom. sg.'. On the other hand, the weak environment can be identified with the traditional concept of the "coda", i.e. the syllable or word final position.[2]

Group (A) in (2), e.g. East Ukrainian, represents, it seems, no departure from the Common Slavonic state of affairs with respect to *w, in that the only reflex available is that of a labial glide in all positions. Group (B), on the other hand, already shows a change, a first step in the direction of becoming an obstruent. However, the (bi)labial fricative or approximant[3] still alternates with the glide, e.g. Standard Ukrainian [ławka] − [ławok] *lavka − lavok* 'bench, nom. sg. − gen. pl.' which might be the reason why a full shift to an obstruent has not taken place. The fricative still exhibits a close affinity to the glide in the alternations, and has not become independent of it, so to speak.

Slovak (C) represents a curious mixture between type (B) and (D). The [v] − [w] alternation places this language in the type (B) group, while the fact that it has a voiceless reflex of the labial fricative indicates its affinity with group (D). However, as a reflex of CSl *w the voiceless labial fricative occurs in only one context in Slovak, namely, domain initially, while the languages of group (D) exhibit regular devoicing of [v] word-finally and before voiceless obstruents word-medially, e.g. Czech [slɔvɔ] − [slɔf] *slovo − slov* 'word, nom. sg. − gen. pl.' and [la:fka] − [la:vɛk] *lávka − lávek* 'footbridge, nom. sg. − gen. pl.'.

Groups (D) and (E) look almost identical. There are, nonetheless, some interesting phenomena concerning the phonological behaviour of [v] in (D) which set

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[2] In the model adopted here, i.e. Government Phonology, the definition of a weak prosodic position would need to be modified slightly due to the strict theoretical assumptions concerning phonological structure. As these distinctions are not relevant to our discussion, we disregard them here.

[3] The real nature of the phonetic realisation of the non-glide is somewhat unclear. The literature on Ukrainian does not give a clear picture, as standardised phonetic symbols are not applied and various impressionistic phonetic descriptions are contradictory. Regional / dialectal variation seems to be one plausible reason for this situation.

this group apart from (E). One such phenomenon is the absence of progressive devoicing of [v] in such forms as, for example, the Standard Czech [tvu:j] *tvůj* 'yours', versus the presence of the devoicing in Standard Polish [tfuj]. Thus group (E) seems to represent the end point for the shift from a sonorant, via a "sonorant fricative", to a full-blooded fricative.[4]

One should stress again that the division into the groups in (1) and (2) is fairly cursory and that all the languages in one group need not behave in the same way in all cases. The important point is that there would appear to be no clear criteria for marking a given segment as an obstruent. This fact undermines the whole idea of "natural class", a conclusion which is supported by the fact that in several cases we can observe the object in question behaving in a Janus-like manner.[5] For example, even though Standard Russian [v] alternates with [f] it does not fully behave as an obstruent in strong positions e.g. [vʌda] *voda* 'water' (Jakobson 1956, Andersen 1969). That is to say, the voiced labial fricative, unlike e.g. the coronal fricative [z], does not spread voicing onto the preceding obstruent. Compare, for example, [ʌdᶦzɔɲı] *ot Zoni* 'from Zonya' and [ʌtᶦvaɲı] *ot Vani* 'from Vanya'.

Finally, group (F) in (1) and (2) is given as an example of how reflexes of the same segment may develop in different directions. Although the model to be presented below has a straightforward way of accounting for this alternation, we will bypass such details for lack of space.[6]

To summarise what we have said concerning the different reflexes of the CSl *w, one can distinguish two main steps in the development on which we want to concentrate in this paper. The first one is characterised by a shift in articulation from [w] to [v] in strong positions but not in weak ones, as exemplified by Standard Ukrainian [sliw] *sliv* 'word, gen. pl.' and [vɔda] *voda* 'water, nom. sg.'. The second full step in the development of CSl *w results in a situation in which [v] no longer alternates with the glide [w] but with the voiceless labial fricative [f]. This can be observed in, for instance, Standard Polish.

Apart from the major changes one would need, of course, to account for the intermediate stages, like the most notable case, Slovak, where both [w] − [v] and [v] − [f] alternations occur, and for other details of the development, like the [v] − [x] alternation in Northern Russian. It is obvious that to answer all these questions one would need to carry out detailed analyses of individual languages, an enterprise which would go very much beyond the scope of this paper. Instead, we will concentrate here only on the most crucial aspects of the shift, while other details, important though they are, will have to be reserved for further study. Let us now introduce the relevant aspects of the theory of melodic representation advocated in Government Phonology.

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[4] This is probably too strong a claim for Polish. Gussmann (1981) argues convincingly that the labial fricative in words like [tfuj] 'yours' could be viewed as a phonological sonorant.

[5] Similar observations about labial fricatives have been made for other languages, for example, Hungarian (Siptár 1996).

[6] The reader is referred to Cyran and Nilsson (in prep.) for a more detailed overview of various facts connected with the development of CSl *w.

2. Segmental representation in GP

There are two major theories which represent completely disparate views on what the subsegmental primes are. One of them is the *feature theory*, in which phonological expressions are composed of distinctive features (e.g. [+high]). These primes are not independently pronounceable, as they acquire phonetic content only if supplemented by other features. Thus, for instance, [+high] and [+back] designate the vowel [u].

Quite a different model of representation is advocated in *element theories* in which segments are composed of one or more elements (Kaye, Lowenstamm and Vergnaud 1985, Harris 1990). Elements are the smallest units in the theory of segmental representations to which phonology has access, but they are big enough to be independently interpretable, a proposal which has been expressed in terms of the *autonomous interpretation* hypothesis (Harris and Lindsey 1995). GP uses three basic vocalic elements (A), (U), and (I) which, when pronounced, correspond to the corner vowels [a], [u] and [i] respectively. These elements may combine to form complex vowels. Thus the combination of (A) and (U) gives the vowel [ɔ], while the fusion of (A) and (I) produces [ɛ].

In non-nuclear positions the elements (I) and (U) correspond to glides [j] and [w] respectively, while the element (A) is sometimes assumed to define [r] (Broadbent 1991, Backley 1993). These elements define resonance (place of articulation) of consonants (3a), while a separate set of purely "consonantal" elements is responsible for the manner dimension (3b). A list of currently used elements in GP is given in (3) below.

(3)
a. RESONANCE *elements define* PLACE *(primary / secondary).*[7]

    U - labial/labialised
    I - palatal/palatalised
    A - coronal[8]

b. MANNER *dimension is defined by truly "consonantal" elements.*

    ʔ - occlusion (stopness)
    h - noise (friction)
    N - nasality
    H - stiff vocal cords (voicelessness)
    L - slack vocal cords (voicedness)

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[7] Note that no separate element is listed to define velarity, which does not mean that the theory has no means of expressing this property. A discussion of this would involve introducing arguments which are extraneous to this presentation.

[8] The status of coronal consonants is a matter of debate, but the question whether the element (A) represents coronal articulation is not crucial to our discussion.

To form complex consonantal segments both resonance and manner elements combine. This is illustrated in (4) below.

(4) a. *lenition*   b. *final devoicing* (Brockhaus 1995)

```
     [p/b]  >  [f/v]  >  [w]        [b] > [p]      [v] > [f]
       |        |        |           |     |        |     |
       x        x        x           x     x        x     x
       |        |        |           |     |        |     |
       U        U        U           U     U        U     U
       |        |                    |     |        |     |
       h        h                    h     h        h     h
       |        |                    |     |
       ʔ        |                    ʔ     ʔ        |
       |        |                    |              |
      H/L      H/L                   L    (L)       L    (L)
```

The decreasing complexity of the segments presented above in (4a) corresponds to the lenition trajectory of the opening type (see for example, Lass 1984:178) and neatly illustrates what is meant by the term *phonological process* in Government Phonology. This model accepts only two types of phonological operations, that is, either *decomposition* or *composition* (deduction or addition of elements). The number of elements corresponds to phonological strength, and lenition in weak environments consists, quite logically, in element deduction.

A word of comment is needed about figure (4b). It is assumed in GP that languages which employ only two types of laryngeal contrasts, i.e. voiced versus voiceless, make use of either the high tone (H), or the low tone (L), but not of both in the same system. Thus the analysis of devoicing given in (4b) is possible for a language which uses (L) for the voiced series of obstruents, while toneless obstruents are interpreted as voiceless. We may assume that final devoicing is a type of yardstick suggesting what specification of the laryngeal dimension characterises a given language. That is, in such languages the voiced obstruents contain (L) while the voiceless series remains unspecified.

Thus, the figures in (4a) and (4b) illustrate decomposition. On the other hand, what seems to have been involved in the historical development of CSl *w in various Slavonic languages is a step-by-step strengthening of the original glide, that is, a process of composition which can be schematically represented as in (5) below.

(5)
    minimal repr. of sonorant   *maximal repr. of labial fricative*

CSl *w   (**U**) >>>>>>>>>>>>> (**U•h•L**)

There are some basic questions which any analysis of the facts discussed above should try to address. First of all, how is the change from a glide to a fricative at all possible? Where does it begin and why? When does a sonorant become an ob-

struent? And finally, how can phonological representation account for the differences in the attested systems A, B, C, D, E, and F, i.e. not only for the clear cut stages like Standard Ukrainian or Standard Polish, but also for the intermediate cases like Slovak?

3. How it all began – a hypothesis

Changes in the phonological systems of different languages may be understood as resulting from a reinterpretation of phonologically non-significant phonetic variants as phonologically significant by subsequent generations of speakers. In the case of the Common Slavonic glide [w], the phonological change might have started off as the labiodental approximant [ʋ], or maybe the bilabial fricative [β], in order to finally, in many cases, end up as the labiodental fricative [v] in the central parts of the Slavonic area, where the origin of these changes most probably is to be sought. Some of the peripheral regions of the Slavonic area still have the most conservative systems, containing only the glide. This refers, for example, to East Ukrainian and Upper Sorbian.

In our view the most important albeit undramatic change was the introduction of friction to the original glide in strong positions, i.e. [wɔda] > [vɔda]. As noted in the introduction to the theory of segmental representation in GP, friction is represented by a separate element (h). So it seems that [v] in Standard Ukrainian [vɔda] could be represented as (h•U), i.e. labiality combined with friction. One could easily imagine that, in such a case, the alternation [v] – [w] consists in the licensing of (h) only in strong positions.

There are, however, at least two reasons why we would wish to reject this possibility. Firstly, on this interpretation, the shift from [w] to [v] would involve the arbitrary addition of an element (h) for which there is no local source, i.e. there is no direct and logical connection between friction and a position in the prosodic hierarchy which a given segment occupies. Secondly, it seems that (h•U) is in fact the representation of a voiceless, or a devoiced labial fricative rather than a voiced one (see (4b)). In view of these objections we propose a different interpretation for the shift, i.e. one which refers to the notion of *headedness*.

Headedness is the means by which the asymmetrical relation between elements in a compound expression is defined. Briefly, elements that fuse have different status. The dominating element of the compound expression constitutes the head. For example, the I-headed combination of (A) and (I), i.e. (A•I)[9] gives a close mid vowel [e]. On the other hand, when (A) is the head (I•A) an open mid vowel [æ] is produced. Finally, if the whole combination is headless (I•A) it yields a neutral mid vowel [ɛ].

In recent proposals, e.g. Charette and Göksel (1996, and this volume), the headedness of elements is made responsible for the tenseness (ATR) contrasts in vocalic systems where simplex objects, i.e. those consisting only of one element, also participate in the contrasts. For example, a headed (U) gives a phonetic

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[9] By convention, the head is underlined.

close [u], while a headless (U) corresponds to a lax [ʊ]. Thus, one could conclude that, in this approach, headedness seems to produce a closing or narrowing effect in vocalic systems.

Applying this to the consonantal system, one might say that in the shift from [w] to [v] the headedness of the resonance element may bring out audible friction in consonants (Cyran 1996, 1997). Thus a headed (U) in a non-nuclear position may be realised phonetically with audible friction and the contrast between [w] and [v] will be that of (U) versus (U), where the former occupies weak positions and the latter is only sanctioned in strong ones. Such a representation of [v] accounts for its sonorant-like behaviour in general, not only in Standard Ukrainian.[10] The remaining questions that need to be addressed here include the motivation for the shift from (U) to (U), and the reason for the [w] – [v] alternation.

The motivation for the shift from [w] to [v] will receive a fairly straightforward explanation in our account because headedness is a property of an element in question rather than a separate phonological category. That is, a headed (U) should be understood as a stronger version of (U), just as the colour black represents a stronger variety of grey. Thus, the shift from [w] to [v] need not involve the addition of new phonological primes. In contrast, it exemplifies a shift in status for the existing element. It may be said that this modification stems from the requirements of the system which adhere to such parametric settings as whether a given language makes use of ATR contrasts in its vocalic system or not. Of course, one has to provide arguments to prove that some reorganisation of the parametric settings has indeed taken place in a given system.

Given our claims concerning the parallel behaviour of resonance elements in the vocalic and consonantal systems it might be worth trying to find such arguments in the vocalic system. Incidentally, in St. Ukrainian a distinction is made between two types of high back vowels, a stressed one which is realised as a tense [u], and an unstressed one which emerges as a neutral/lax [ʊ] (Bilodid 1969). Note that this is exactly what we expect, namely, a parallel between the consonantal and vocalic systems which is due to the fact that we are dealing with the same melodic content but placed in different prosodic configurations. [u] can be represented as a headed (U) and is found in prosodically strong positions (under stress). The same object, i.e. (U), corresponds to [v] in prevocalic positions. On the other hand, both the vowel [ʊ] and the glide [w] are represented as (U), as only this object can be licensed in prosodically weak positions.[11] The only difference between [u] and [v] on the one hand, and [ʊ] and [w] on the other, lies in the type of the immediately dominating prosodic constituent, i.e. whether (U)

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[10] One could argue that the same representation could be proposed for Russian word initial [v] which does not cause voicing of a preceding obstruent simply because it does not have a low tone element (L) to spread. Recall the examples [ʌd ˈzɔɲɪ] *ot Zoni* 'from Zonya' and [ʌt ˈvaɲɪ] *ot Vani* 'from Vanya'.

[11] This type of relationship, that is, between headedness and prosodic position is not arbitrary and has many advantages. For example, it accounts for vowel reduction in recessive positions (Harris 1994).

or (U) is found in the nuclear or non-nuclear position. In weak environments, quite predictably, the ATR contrast in vowels and the friction in the consonant [v] are lost. These two seemingly disjoint phenomena receive a uniform treatment in our account. It appears that in East Ukrainian no such distinction between [u] and [ʊ] is found, and hence no [w] − [v] alternations are expected. This fact supports our analysis of the shift [w] > [v].

Thus the first step in the strengthening of the labial glide to a labial fricative may be understood not so much as an isolated phonological phenomenon but as the result of a major shift in the system, i.e. the introduction of headedness contrasts. To explore the question of what caused this shift would go beyond the scope of this presentation. We may assume, for the moment, that it was due to a change of a parametric nature. In other words, the language in question began to use the available option of headedness contrasts. Our analysis of the shift [w] > [v] and especially of the alternation [v] − [w] in Standard Ukrainian is strongly corroborated by facts from other languages. For example, in Irish, an identical analysis, that is, one where headedness evokes friction in "sonorants", can be applied to the alternation between the fricative (trilled) and flapped [r] which occur in strong and weak positions respectively (Cyran 1996, 1997).[12] Given the universal nature of representing labial glides by the element (U) and of the mechanism of headedness, we expect that similar phenomena will occur even in non-Indo-European languages. This prediction is fully borne out, by for example, the facts from Hungarian (Siptár 1996). Let us now turn to the second stage in the development of labial fricatives and consider some theoretical consequences of this way of viewing such phonological changes. This brings us to obstruentisation proper.

4. Obstruentisation

In the previous section we maintained that the first step in the strengthening of the labial glide, that involving headedness, was crucial from the point of view of the whole development, although it was not too dramatic phonologically (6), as it merely involved a shift in status for the element (U) from operator to head.

(6)
>   *1st step*
>   [w] > [v] = (**U**) > (**U̲**)

Since the strengthening took place in prosodically strong positions, we still witness the [v] − [w] alternation. The significance of the change in (6) lies more in its phonetic outcome, that is, in the shift [w] > [v], because phonologically, the object still retains its sonorant-like characteristics. The second major step in the

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[12] The difference in the representation of the two reflexes is that between a headed (A̲), representing fricative [r], and (A), denoting a flap. For a phonetic description of the Irish facts see, e.g. Ó Cuív (1975).

development of CSl *w involves, quite conversely, a minimal change in the phonetic outcome but a fairly substantial phonological reinterpretation.

(7)
>   *2nd step*
>   (**U̲**)   >   (**L•h•U**)

We claim that it is the second shift, i.e. the one illustrated in (7), that can be regarded as obstruentisation proper, although it would be impossible without the initial stage shown in (6). It is at this stage, i.e. in (7), that we depart from the [v] − [w] alternation as found in Standard Ukrainian and begin to witness the alternation between [v] and [f] in the same environments, which results from the tone element (L) being licensed or failing to be licensed, i.e. (L•h•U) − (h•U).

The motivation for the phonological reinterpretation in (7) is pretty straightforward and uncontroversial in that it consists in assigning phonological status to phonetically present properties. That is to say, the phonetic realisation of the object (U̲) involves both friction, which is normally defined by the element (h), and voicing, typically associated with the presence of (L). What has undergone a change is the status of these properties; from merely realisational to truly phonological.

We hope that the advantages of the "two-stage analysis" presented in this paper over a "one-stage shift", i.e. a direct change *(U) > (L•h•U), are obvious. Some arguments against the latter have been put forward in the previous section. On the other hand, the "two-stage analysis" offers several valuable predictions. One of them is that it provides a direct way of expressing the intuition formulated by linguists working in quite disparate frameworks (Andersen 1969, Gussmann 1981, Rubach 1993), namely, that in describing Slavonic languages, one finds oneself in a situation where an object sounds like a typical obstruent due to its having distinct friction, and yet acts like a typical sonorant. Let us repeat some examples illustrating this state of affairs:
- Standard Ukrainian [v] alternates with a glide.
- Standard Russian initial [v] does not spread voicing onto the preceding obstruent. Recall the examples [ʌdˈzɔɲɪ] *ot Zoni* 'from Zonya' and [ʌtˈvaɲɪ] *ot Vani* 'from Vanya'.
- In Czech and peripheral Polish [v] resists progressive devoicing and does not spread voice onto the preceding obstruent, e.g. Polish [tvuj] *twój* 'yours'.
- Finally, a clear distinction between two types of labial fricatives is also required in Slovak in order to account for the two kinds of alternations, namely, [v] − [w] and [v] − [f]. In our analysis we assume that in Slovak two representations of [v], i.e. (U̲) and (L•h•U), exist side by side.

Additionally, we are able to suggest a possible answer to the well-known fact that obstruentisation of sonorants typically results in voiced obstruents (Kenstowicz 1994). This analysis shows precisely why this is the expected development. Given the spontaneous voicing of sonorants and the "two-step" model of

obstruentisation, a voiced object is exactly what one would predict. In the first step, e.g. Standard Ukrainian [v] (6), we are still dealing with a phonological sonorant which must be voiced. On the other hand, a full reanalysis of all the phonetic properties of [v] as phonological will have to involve voicedness (7). This is yet another reason why the introduction of friction in Standard Ukrainian [v] should not be viewed as arising from the addition of the element (h), because the compound (h•U) typically corresponds to a voiceless [f]. Thus we would lose our generalisation that the expected result of obstruentisation is a voiced obstruent.

Quite a separate issue, and one which requires more study, is the fact that the two ways of expressing friction, i.e. through the headedness of the resonance element or by means of a separate element (h), may allow us to derive the special (ambiguous) status of fricatives in a fairly direct way.[13] The model adopted here also predicts why stops will exhibit altogether different characteristics. This fact follows from the presence of a separate category in these objects, i.e. (?), which will ensure that "a stop is a stop is a stop", regardless of the options that a given language selects to define friction.

5. Conclusion

Despite the variety of facts presented in (1) and (2), we have concentrated only on those aspects of the development of CSl *w which we find most significant. We propose that the obstruentisation of the historical glide was a process of strengthening which must have taken place in at least two stages. We realise that our model of the historical change [w] > [v] is based on fairly general premises and may have to be revised when confronted with further details from individual languages.

Further study is required to elaborate on the consequences of this analysis. For example, the picture of the "natural class" which emerges from this discussion suggests that the concept requires reinterpretation if not abandonment, a conclusion which is fairly unsurprising and certainly not inherent to this analysis only. Furthermore, our model offers a suggestion as to what might constitute the distinguishing factor between sonorants and obstruents. One could tentatively propose that sonorants, as opposed to obstruents, are composed solely of the resonance elements which render them vowel-like. Logically, obstruents are characterised by the presence of manner elements. As suggested above, these and other issues, which are implicit in the proposed account, require further intensive study.

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[13] Other advantages of having two representational options are discussed in Cyran (1996, 1997). For example, with two representations it is possible to account for such phenomena as the absence of affricates and voicing contrasts among fricatives in a given system (e.g. Irish), or to formulate a unified account of such distinct historical processes as rhotacism and Verner's Law.

References

Andersen, H. (1969) The phonological status of the Russian labial fricatives. *Journal of Linguistics* 5:121-127.

Bilodid (1969) = I. К. Билодид (ред.) *Сучасна українська литературна мова. Вступ. Фонетика.* Київ: Наукова думка.

Backley, P. (1993) Coronal: the undesirable element. *UCL Working Papers in Linguistics* 5:301-323.

Broadbent, J. (1991) Linking and intrusive *r* in English. *UCL Working Papers in Linguistics* 3:281-302.

Brockhaus, W. (1995) *Final devoicing in the phonology of German*. Tübingen: Max Niemeyer Verlag.

Charette, M. and A. Göksel (1996) Switching and vowel harmony in Turkish. In H. Kardela and B. Szymanek, eds., 29-55.

Cyran, E. (1996) The parametric occurrence of elements in phonological systems. In H. Kardela and B. Szymanek, eds., 75-98.

Cyran, E. (1997) *Resonance elements in phonology. A study in Munster Irish*. Lublin: Folium.

Cyran, E. and M. Nilsson (in prep.) CSl *w: its past and present.

Dukiewicz, L. and I. Sawicka (1995) *Fonetyka i fonologia*. Kraków: Wydawnictwo Instytutu Języka Polskiego PAN.

Gussmann, E. (1981) Glide shifts in Polish. In *Phonologica 1980*. U. Dressler, O. E. Pfeiffer, and J. R. Rennison, eds., 169-178. Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.

Harris, J. (1990) Segmental complexity and phonological government. *Phonology* 7:255-300.

Harris, J. (1994) *English sound structure*. Oxford: Blackwell.

Harris, J. and G. Lindsey (1995) The elements of phonological representation. In *Frontiers of phonology: atoms, structures, derivations*. J. Durand and F. Katamba, eds., 34-79. London: Longman.

Jakobson, R. (1956) Die Verteilung der stimmhaften und stimmlosen Geräuschlaute im Russischen. In *Festschrift für Max Vasmer*, 199-202. Berlin: Harassowitz. Reprinted in R. Jakobson (1971) *Selected Writings*, vol. I. *Phonological studies*, 505-509. The Hague, Mouton.

Kardela, H. and B. Szymanek, eds. (1996) *A Festschrift for Edmund Gussmann from his friends and colleagues*. Lublin: Redakcja Wydawnictw KUL.

Kaye, J., J. Lowenstamm, and J-R. Vergnaud (1990) Constituent structure and government in phonology. *Phonology* 7:193-231.

Kenstowicz, M. (1994) *Phonology in generative grammar*. Oxford: Blackwell.

Král', Á. (1984) *Pravidlá slovenskej výslovnosti*. Bratislava: Slovenské pedagogické nakladateľstvo.

Lass, R. (1984) *Phonology: an introduction to basic concepts*. Cambridge: Cambridge University Press.

Nilsson, M. (1996) Voicing alternations in Slavic: what, where, why?. In *Festskrift för Bengt Lundberg*. Göteborg: Institutionen för Slaviska Språk.

Nilsson, M. (in prep.) *Contemporary Czech phonology*. Göteborg: Institutionen för Slaviska Språk.

Ó Cuív, B. (1975) *The Irish of West Muskerry, Co. Cork. A phonetic study*. Dublin: The Dublin Institute for Advanced Studies.

Palková, Z. (1994) *Fonetika a fonologie češtiny s obecným úvodem do problematiky oboru*. Praha: Karolinum.

Rubach, J. (1993) *The lexical phonology of Slovak*. Oxford: Clarendon Press.

Siptár, P. (1996) A Janus-faced Hungarian consonant. *The Even Yearbook* 2:83-96.

Šewc, H. (1968) *Gramatika hornjoserbskeje rěče* I: *fonematika a morfologija*. Budyšin: Domowina.

Zilyns'kyj, I. (1979) *A phonetic description of the Ukrainian language*. Cambridge, Mass.: Harvard Ukrainian Research Institute.

Domains, relations, and the English agma[*]

Edmund Gussmann

The English velar nasal [ŋ] has played a prominent role in the history of phonological theory in the 20th century. In contradistinction to the phonetic tradition which viewed it as a single nasal on a par with other nasal consonants, Edward Sapir (1925) offered an interpretation based on his psychological approach to the phoneme. For Sapir the velar nasal — despite its phonetic parallelism to the labial or alveolar nasals — is a complex unit: using terminology of more recent origin, the final velar nasal of *bring* [brɪŋ] could be said to be a contextual realisation of the cluster /ŋg/. The reasons for making such a sharp break with the phonetic reality would lead main-stream generative phonology to adopt Sapir's analysis a few decades later. We will review them below and also add some more arguments in support of this position.

As is well-known, Sapir's "phonologic representation" (see McCawley 1967, Anderson 1985:228 ff.) did not enjoy much popularity in the post-Bloomfieldian period. The velar nasal was recognised as having a firm phonemic status within the phonology of English since it satisfied the standard requirements of the analysis. Contrasts such as the following could not be by-passed by a model where minimal pairs were the deciding factor in any interpretation: *fan* [fæn] — *fang* [fæŋ], *brim* [brɪm] — *bring* [brɪŋ], *win* [wɪn] — *whim* [wɪm] — *wing* [wɪŋ]. Infrequent alternations such as *in* [ɪn] — *income* ['ɪŋkəm], *long* [lɔŋ] — *longer* ['lɔŋgə] – *length* [leŋkθ] would be assigned to the morphophonemic component, while various distributional peculiarities such as the non-appearance of the velar nasal word-initially would be seen as gaps in the distribution of no phonemic significance. The position of the velar nasal was secure as long as the paradigmatic bias of phonology started with and restricted itself to contrastive units and their phonetically conditioned variants or realisations.

The advent of generative phonology with its refusal to contemplate surface contrasts as theoretically significant brought about not only a return to Sapir's mentalistic attitude but a development of a fundamentally derivational framework.[1] Such a model could easily recognise underlying representations which

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[1] There is an alternative interpretation of this notion where "derivation" means "defining phonological grammaticality"; in this sense any phonological theory can be called derivational. In what follows we shall use the term in the more restricted sense which entails intermediate levels related by ordered rules.