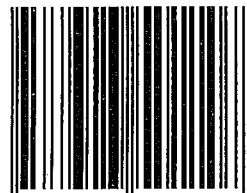


The present volume is a collection of papers selected from presentations given at two meetings of Generative Linguistics in Poland (GLiP), hosted by the University of Warsaw.

GLiP is a series of conferences on various aspects of generative linguistics, with topics of the meetings alternating primarily between syntax, morphology and phonology. The present volume is an outcome of GLiP 3 and GLiP 4, devoted to (morpho)phonology and (morpho)phonological acquisition. The common denominator of the papers included here is that all of them are set within constraint-based frameworks, mainly various versions of Optimality Theory, and apart from that, Government Phonology and Relational Network Theory. The languages under investigation include English, Greek, French, Polish, Russian, Ukrainian, viewed from the synchronic, diachronic and acquisitional perspectives.

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Studies in Constraint-based Phonology



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edited by  
Piotr Bański, Beata Łukaszewicz,  
Monika Opalińska

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Wydanie I

Druk i oprawa: Fabryka Druku

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## Introduction

The present volume is a collection of papers selected from presentations given at two meetings of Generative Linguistics in Poland.

Generative Linguistics in Poland (GLiP) is a series of conferences on various aspects of generative linguistics, initiated by Piotr Bański and Adam Przepiórkowski in 1999 and held annually in Warsaw. Meetings 3 and 4 took place in April 2001 and March 2002, respectively, and have been so far the only meetings devoted to phonology.

At first glance, the present collection might appear to group very diverse papers dealing with diverse languages. The majority focus on stable adult systems, but some are concerned with phonological development (Archibald, Łukaszewicz, Tzakosta & van de Weijer). While most of them analyse synchronic data, there are also elements of diachrony (Opalińska, Scheer). The paper by Čavar presents an extended approach to the domain of phonological investigations, arguing for auditory-based representations and constraints. Czaplicki, in turn, analyses data from Ukrainian, a language hitherto largely neglected in generative studies.

Two papers, authored by keynote speakers of both GLiP 3 and 4, Tobias Scheer and John Archibald, respectively, take a broader perspective, offering a unified account of apparently unrelated phenomena and diverse sets of data (Scheer) and a bird's-eye view of various language-acquisition theories (Archibald).

The common denominator of the papers included here is that all of them are set within constraint-based frameworks, mainly various versions of Optimality Theory, and apart from that, Government Phonology (Scheer). The Relational Network Theory paper by Sullivan stands out as an attempt at providing a meta-anchor for various generative (and primarily constraint-based) approaches.

We wish to express our gratitude to Prof. Emma Harris, the Director of the Institute of English Studies, University of Warsaw, for her never-

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## How yers made Lightner, Gussmann, Rubach, Spencer and others invent CVCV\*

### 1. Introduction

For some time, work has been done in phonology assuming that syllable structure boils down to a strict sequence of non-branching Onsets and non-branching Nuclei (Lowenstamm 1996).<sup>1</sup> The diagram below depicts the representation for basic phonological objects in this perspective, which has been called “CVCV”.

(1)

“T” = any obstruent, “R” = any sonorant

closed syllable	geminate	long vowel	[...C#]	“branching Onset”
ONON	ONON	ONON	...ON	ONON
	\ /     \ /			
CVRø	C V C V	C ø	T ø	R V

In traditional approaches, the syllabic tree structure assures the function of binding together the different constituents and thereby identifies their grouping into higher units. In the option shown under (1), this function is shifted onto lateral relations that are assumed to hold between

\* This article was written in 2001 and represents my analysis at this point in time. Some aspects have been superseded by subsequent publications, namely in my 2004 book (chapters II,9 and II,10).

<sup>1</sup> For example Bendjaballah (1999a, b), Heo (1994), Larsen (1998), Lowenstamm (1988, 1996, 1999), Nikiema (1989), Scheer (1996, 1998a, 1999, 2000), Ségéral (1995, 1996), Ségéral & Scheer (2001), Szigetvári (1999, 2000), Rowicka (1999).

constituents: Government and Licensing. Effects that are usually attributed to the fact that a given segment belongs to this or that syllable are claimed to stem from the configuration regarding Government and Licensing this segment is involved in. The reasons to consider an approach where constituents are organized according to syntagmatic rather than paradigmatic relations are exposed in, among others, Ségéral & Scheer (2001), Scheer (1998a, b, 1999, 2000), Szigetvári (1999, 2000).

In this paper, I would like to show that CVCV roots much deeper in the history of generative phonology than its inventor thought it did. Namely, the idea of CVCV goes back to the thesis of Theodore Lightner (1965) on Russian (see also Lightner 1972), and was practiced in both linear SPE and autosegmental generative frameworks in the late seventies until the end of the eighties. However, the actors of this tradition did not make any stand as to the theoretical and possibly universal value of the structures they were proposing. Lightner's insight was the synchronic expression of a diachronic generalization made by Antonín Havlík in 1889, which is known as the Havlík's Law (Havlík 1889). I wish to bridge the gap between both groups of scholars: the ones that were doing CVCV without giving it a theoretical status, and those who have derived CVCV theoretically in order to run its predictions against a variety of languages. Of course, a good question to be asked is why both groups did not see each other. I submit that the answer is simple: Slavic. This language family is very present in SPE, and the reason why CVCV was practised through the 70s and 80s was a typical Slavic phenomenon, probably the most important issue in Slavic phonology: the yers. Gussmann (1980), Rubach (1984, 1986), Kenstowicz & Rubach (1987), Spencer (1986) and others have developed analyses that are *de facto* CVCV, which really looks far fetched for languages that are reputed for their excessive consonantal clustering. Since yers are an idiosyncratic property of Slavic that is not found in other families, the yer-analysis was not exported. No claim was made to the effect that English or French should follow the same pattern. Another factor is that the formal approach of CVCV presupposes the tools developed in Government Phonology (Kaye et al. 1990, Charette 1991, Harris 1994): Government and Licensing, which did not exist or were in an embryotic state by the time the Slavic data were discussed.

On the other hand, when CVCV was proposed as a formal frame with cross-linguistic scope, there were no Slavicists that had lived through the yer-period among the people that were developing this approach. It was not immediately obvious to understand 1) that the typical treatment of yers is *de facto* CVCV; 2) that linear versions thereof (Gussmann 1980, Rubach 1984) could not be CVCV because there were no syllabic constituents, while autosegmental approaches failed to coin their structures as a theoretical claim because yers were a Slavic internal matter; 3) that the reasons that drove Slavic analyses to embrace CVCV-representations were exactly identical to a prominent motivation that made CVCV emerge as a theoretical claim in the late 90s: disjunctive contexts.

I wish to show the motivations on both sides, and suggest that the compendium that people who work in the CVCV-paradigm believe to substantiate their approach is actually much larger than they think it is. And that the spine of Slavic phonology that was developed by Lightner, Gussmann, Rubach, Spencer and others is in fact a natural and prenatal expression of CVCV. Hence, the former should be inclined to accept the analyses of the latter, while the latter could find a natural theoretical harbour for what they were doing over the years. The fusion of this process, then, suggests that CVCV is worthwhile and should be taken as a serious candidate for the representation of syllabic structure.

Before sketching the structure of the paper, the reader must be warned: section two reviews the basic distributional facts of Slavic synchrony (Lower) and diachrony (Havlík's Law). Slavicists will be bored to death since this evidence has been rehearsed over and over again in countless publications over the past 40 years. The same holds true for the reader who is familiar with the French data that are adduced in section four. Ever since French has been carried into the spotlight of generative interest by Schane (1968), the data regarding the ATR value of mid vowels and schwa-[e] alternations have been discussed. I suggest that either public skips the relevant section, which makes the paper somewhat shorter.

Section three exposes some facts from Slavic that are governed by the same context as vowel-zero alternations but are less well known. In

section five, the overall puzzle including both Slavic and French evidence is assembled. The different approaches are discussed, some of which will not resist the cross linguistic test. Finally, a synthesis of the two empirical records in the light of Government Phonology is undertaken in section six.

## 2. Slavic yers and their analysis

### 2.1. Distributional facts and the challenge they raise

The basic pattern of vowel-zero alternations that is recurrent throughout all Slavic languages appears in (2) below.<sup>2</sup>

#### (2) basic pattern of Slavic vowel-zero alternations

	C C-V	C C-∅	C C-CV	gloss
Czech	lokot-e	loket-∅	loket-ni	"elbow" GENsg, NOMsg, adj.
Polish	wojon-a	wojen-∅	wojen-ny	"war" NOMsg, GENpl, adj.
etc.				

In view of these data, the alternation is correctly captured in terms of open vs. closed syllables: a vowel appears in closed syllables (*loket-∅*, *loket-ni*), while zero occurs in open syllables (*lokot-e*). Hence, it can be claimed that the vocalization of alternation sites is a direct consequence of syllable structure: if a Coda needs to be accommodated within a syllable, this syllable must not remain unvocalized. The presence or absence of a vowel following the alternation site stands in no causal relation with the effect observed: word-final consonants that are not followed by a vowel do trigger vocalization of their syllable just as much as word internal

<sup>2</sup> Examples are chosen from Czech and Polish. See Scheer (1996, 1997, 1999) on Czech alternations. For Polish, Rowicka (1999) offers an informed discussion of literature and facts. Lightner (1965, 1972), Melvold (1989), Farina (1991), Yearly (1995) (Russian), Rubach (1993) (Slovak), Hristova (1994) (Bulgarian), discuss other particular languages. The general Slavic picture is exposed in e.g. Bethin (1998: 205ff), Panzer (1991: 303ff), Vaillant (1950: 124ff).

consonants that are followed by another heterosyllabic consonant and a vowel.

Hence, the vowel-zero alternations observed seem to be entirely predictable from syllable structure. The existence of a following vowel and its quality plays no role at all. However, this naive view on the matter must be revised when facing the data that are reported in (3).

#### (3) vocalization in open syllables

	open syllable		closed syllable		
	zero	vowel			
	C C-V	C C-∅	C C-∅	C C-CV	gloss
Czech	dom-∅k-u	dom-eč-ek-∅	domek-∅	dom-eč-∅k-u	house dim. GENsg, double dim. NOMsg, dim. NOMsg, double dim. GENsg
Slovak	krid-∅l-o	krid-el-iec-∅	krid-el-∅	krid-el-∅c-e	wing dim. NOMsg, double dim. GENpl, dim. GENpl, double dim. NOMsg
Polish <sup>3</sup>	buł-∅k-a	buł-ecz-ek-∅	buł-ek-∅	buł-ecz-∅k-a	bread row dim. NOMsg, double dim. GENpl, dim. GENpl, double dim. NOMsg
Serbo-Croatian <sup>4</sup>	vrab-∅c-a	vrab-ac-a	vrab-ac-∅		sparrow GENsg, GENpl, NOMsg

As can be seen, another recurrent pattern in Slavic languages is the existence of forms where the alternation site is vocalized in spite of the fact that it occurs in an open syllable. The offending items appear in column two of the above table (the paradigms shown are fully regular in the languages at hand). The distributional solution to this problem is also provided by the data:

<sup>3</sup> The symbols "cz" and "č" are Polish/Czech spelling for [tʃ] and represent the palatalized version of [k] in the words discussed.

<sup>4</sup> The alternating identity of the final vowel in GENpl *vrab-ac-a* may not be established synchronically since morphology does not allow to add another suffix. However, GENpl *vrab-ac-a* contrasts with GENsg *vrab-∅c-a*, and more generally with all other nominal forms: 11 out of 12 vowel-initial case-markers (for a total of 14, seven sg, seven pl; only NOMsg and ACCsg are zero) provoke the allomorph containing zero *-∅c-*, only GENpl induces its vocalized version. It is a fact that the GENpl marker, and only this marker, goes back to a yer diachronically. This can hardly be taken as an accident.

- (4) alternation sites are vocalized in open syllables iff the following vowel alternates with zero itself.<sup>5</sup>

Indeed, in all cases where an alternation site is vocalized in an open syllable (pol. *buł-eczek-ø*), the vowel of the next syllable alternates itself with zero (pol. *buł-ecz-øk-a*). In other words, the fact that we observe a vowel in pol. *buł-ecz-øk-ø* is a direct consequence of the idiosyncratic properties of the diminutive suffix *-ek* whose vowel alternates with zero. Alternation sites are never vocalized in open syllables if the following vowel is stable.

For historical reasons that will be discussed in section 2.3, vowels that alternate with zero in Slavic languages are called “yers”. Yers were regular vowels in Common Slavic. They come along in two flavours, one front “ɨ” and one back “ʉ”. Accordingly, the relevant distributional generalization must state that zero occurs in closed syllables and before yers. This disjunctive context is identified in SPE-fashion in (5).

- (5) alternation sites

V /	—	$\left. \begin{array}{l} \text{CCV} \\ \text{C\#} \\ \text{C}_{\text{ɨ}, \text{ʉ}} \end{array} \right\}$	in Closed Syllables before yers	<i>buł-ecz-k-a</i> <i>buł-ek-ø</i> <i>buł-ecz-øk-ø</i>
ø /	—	CV	iff V ≠ ɨ, ʉ	<i>buł-øk-a</i>

The challenge raised by this distribution is its disjunctivity. In early Generative Phonology, the disjunctive context “before a (heterosyllabic) consonant or word-finally”  $\_ \{C, \#\}$ , which is recurrent in the description of a wide range of phonological processes from genetically unrelated languages, has led to major revisions of the frame established by SPE. It was argued that phonological theory must be able to refer to both sites as

<sup>5</sup> The usual formulation says “...in open syllables iff the following vowel is a yer”, see for example Gussmann (1980), Rubach (1984). It is one of the important goals of this paper to show that the crucial property of the triggering vowel in the following syllable is NOT to be a yer or a schwa, but to alternate with zero (Scheer 1997: 71).

a phonologically unique object if no generalization is to be missed.<sup>6</sup> This view led to the (re)introduction of Codas and hence syllable structure into the hitherto linear theory. More recently, Ségéral & Scheer (2001) have made a case along the same lines for the disjunctive context that is the exact mirror of the Coda-context: “after a (heterosyllabic) consonant or word-initially”  $\{C, \#\}$ . In any event, it is a consensual practice that theory is called to be able to attribute identical effects to one single reason, rather than to different and unrelated causes. In our case, the question thus arises in what way closed syllables and yers constitute a natural class. Put in another way, this question may also sound “why do yers behave like a consonant, rather than like a vowel?”, given  $\_ \text{CCV} = \_ \text{C}_{\text{ɨ}, \text{ʉ}}$  vs.  $\_ \text{CV}$ . Expressed yet in a different fashion, one could ask why yers behave as if they were not there: if  $\_ \text{C}_{\text{ɨ}, \text{ʉ}} \text{CV}$  reduced to  $\_ \text{CCV}$ , the Closed Syllable generalization would be correct in all instances.

In the next section, we will see how this challenge has been dealt with since the 60s.

## 2.2. Lower

If there is any chance to state the distribution of vocalized and unvocalized alternation sites in terms of a non-disjunctive context, the formulation must not include any reference to closed vs. open syllables: the closed-syllable analysis is contrary to fact. Hence, the only alternative is to explore the opportunities of generalizing the yer context: no vowel appears in an alternation site if and only if a yer is present in the following syllable. This is the essence of Lightner’s (1965) proposal, which is known as “Lower”. The rule appears in (6), where yers are transcribed according to traditional diachronic and generative practice  $\text{ɨ}=\text{ĭ}$ ,  $\text{ʉ}=\text{ĭ}$ .<sup>7</sup>

<sup>6</sup> See orthodox textbook evidence given in, among others, Carr (1993: 198ff), Roca (1994: 134f), Goldsmith (1990: 103ff), Lass (1984: 250ff), Blevins (1995: 209). This issue was first brought into generative discussion by Kahn (1976: 20ff).

<sup>7</sup> The historical object “yer = vowel in Common Slavic” had appeared in synchronic analysis since Halle (1959).



## (6) Lower

ĩ, ĩ → e, o / \_\_C<sub>0</sub> {ĩ, ĩ}

In Lightner's view and in all following analyses that use a version of Lower, yers are vowels that are present in underlying representations and appear as various vowels in different Slavic languages. In some idioms, the front-back opposition is carried onto the surface, while in others both yers merge into one single phonetic object. For instance, Western Slavic merges both yers into [ɛ], Eastern Slavic transforms /ь, ъ/ into [ɛ, ə], respectively, while both yers appear as [a] in South Slavic<sup>8</sup>: compare /dьn/ "day" and /сѣн/ "dream" in Polish (*dzień, sen*), Russian (*den', son*), and Serbo-Croatian (*dan, san*).

For theory-internal reasons that do not relate to the present demonstration<sup>9</sup>, as well as for the sake of their diachronic value (ь, ъ < IE i, u), the yers were located in the central upper part of the vocalic triangle, enjoying descriptions such as "high front centralized lax vowel" for /ь/ and "high back centralized lax vowel" for /ъ/. In the course of the derivation, yers could have two fates: either they were lowered to some mid or low vowel (according to the language concerned), or they were deleted.<sup>10</sup> The latter event was said to take place after the former. Thus, a yer could never be surprised in its underlying identity on the surface: the only phonetic trace of yers were said to be non-high vowels. This is where the name of Lightner's rule comes from.

<sup>8</sup> These are only general indications. The detail language by language is much more complicated. In Slovak for example, various vocalizations can be found, cf. Rubach (1993: 134ff).

<sup>9</sup> See e.g. Gussmann (1980: 39ff, 63ff), Rubach (1984: 28f) on that issue.

<sup>10</sup> The debate on the kind of deletion that occurs (stray erasure vs. erasure by rule) is not relevant here; see Rubach (1984: 184ff, 1993: 140f) for discussion. Note that even in case both yers are merged into the same phonetic result, it may be necessary to posit two distinct underlying identities. In Polish for example, the front yer leaves a trace on the preceding consonant /dьn/ → [dʑɛɲ], whereas the back yer does not /сѣн/ → [sen] (but see Gussmann 1992 for a solution capitalizing on underlying palatalized consonants).

Another important property of yers is their unpredictable distribution among words: yers occur in roots and affixes just as other vowels do, their occurrence may be predicted by reference to no other parameter. For instance, the surface-representatives of yers may be phonetically identical with regular vowels whose quality has not been acquired through Lower, and which do not alternate: compare e.g. Czech *pes* [pes], *psa* [psa] "dog NOMsg, GENsg" with *les* [les], *lesa* [lesa] "forest NOMsg, GENsg". Hence, yers must be present in the lexicon, and insertion-strategies that would fill in a vowel in the appropriate syllabic environment do not qualify.<sup>11</sup> Furthermore, yers must possess an underlying identity that is different from the one of phonetically identical vowels that do not alternate, that is /рѣс/ for "dog" vs. /лес/ for "forest" in the above example.

Let us now return to the issue raised at the end of the previous section. We have seen the reasons that led to the proposal of Lower. However, if vocalization takes place in case a yer is present in the following syllable, there must be yers in word-final position. In other words, Lower enforces the existence of underlying yers that never appear on the surface. Consider the four relevant contexts that bear yers and their ensuing derivation in (7).<sup>12</sup>

	underlying	Lower	yer-deletion	surface
a.	buł-íčz-ík-a	buł-ecz-ík-a	buł-ecz-k-a	bułecz-k-a
b.	buł-ík-ĩ	buł-ek-ĩ	buł-ek	bułek
c.	buł-íčz-ík-ĩ	buł-ecz-ek-ĩ	buł-ecz-ek	bułecz-ek
d.	buł-ík-a	buł-ík-a	buł-k-a	bułk-a

Note that in (7)c, Lower must apply two times and from left to right (or from the root towards the periphery) in order to transform //buł-íčz-ík-

<sup>11</sup> Treatments relying on insertion have been proposed by, among others, Laskowski (1975), Czaykowska-Higgins (1988), Piotrowski (1992a). They are convincingly refuted in Gussmann (1980: 26ff), Rubach (1984: 28f, 1993: 134ff), Szypra (1992: 280ff, 1995: 94ff). See Bethin (1992) for a compromise that relies on both epenthesis (in borrowings) and underlying specification.

<sup>12</sup> Parts of the derivations that are not relevant for the demonstration are left unmentioned, cf. for example Gussmann (1980: 41ff), Rubach (1984: 184ff).

ǐ// into /buł-ecz-ek-ǐ/. This effect is commonly viewed as a consequence of the cyclic application of Lower (Rubach 1984: 184ff, 1993: 139f).

Word-final yers have to be present because yers are the only objects that may trigger vocalization according to Lower. As a matter of fact, all words whose last phonetically expressed segment is a consonant were assumed to end in yers underlyingly: the yers in question were attributed the morphological value of a case-marker (i.e. marking NOMsg in (7)b and GENpl in (7)c).<sup>13</sup> The same holds true for yers that occur between two consonants which form a cluster on the surface: [bułeczka] must possess an underlying yer between /cz/ and /k/ since the only reason for the vocalization of the alternation site located between /t/ and /cz/ is the presence of a yer in the following syllable. Moreover, the existence of a yer in the middle of the cluster [czk] is confirmed by its phonetic existence in (7)c.

According to Lower, there are thus two ways of identifying the underlying presence of yers: 1) if a vowel alternates with zero, it is the surface realization of a yer; 2) the object that occurs to the righthand side of the consonant following an alternation site must be a yer, even if there is no vocalic trace on the surface.

In the next section, we will examine the diachronic reality of yers.

### 2.3. The difference between Lightner and Havlík

In 1889, Antonín Havlík discovered the following diachronic regularity when comparing Common Slavic (CS) to Old Czech (OCz).<sup>14</sup>

#### (8) Havlík's Law

- a. given a sequence of consecutive yers in CS, every second yer survives in Old Czech, counting from the right edge of the sequence.

<sup>13</sup> See Gussmann (1980: 36ff), Rubach (1984: 41ff) for discussion. The choice between the front and back versions of the yer is usually determined by palatalization effects.

<sup>14</sup> See general descriptions of the evolution of yers for example in Trávníček (1935: 46ff), Lamprecht et al. (1986: 46ff), Liewehr (1933: 91ff).

#### b. illustration thereof

	4 3 2 1		4 3 2 1		
CS	съ рѣс-ѣмь > OCz	se pøš-emø	se psem	“with the dog”	
	5 4 3 2 1		5 4 3 2 1		
CS	съ шѣв-ѣс-ѣмь > OCz	sø šev-øc-emø	s ševcem	“with the shoemaker”	

This historical evolution is best reflected in Czech, which is more regular in this respect than other Slavic languages. But very soon, it was understood that Havlík's Law in fact applies to all Slavic languages. It covers the third line of the synchronic generalization (5) which states that a yer is vocalized if it occurs before another yer. While both Havlík's Law and (5) define the vocalization of yers according to the presence or absence of a following yer, they do not apply this condition in the same way. The former qualifies a yer followed by another yer for vocalization if and only if this yer is even-numbered in a yer-chain, while the latter does not inform of any condition relying on even- or odd-numberedness. This is the first remarkable difference between Havlík's and Lightner's synchronic generalization embodied in (6). The second one concerns directionality: Havlík attributes odd and even numbers of a yer-chain from right to left, whereas Lower (6) must apply cyclically, which means in terms of directionality from left to right in case it faces several yers in a row (/buł-icz-ik-ǐ// comes out as /buł-ecz-ek-ǐ/ only after recursive application of Lower first to the leftmost, then to the intermediate yer, cf. 2.2).

In sum, the philological point of view holds that even-numbered yers are “strong”, while odd numbered yers are “weak”. The former are vocalized, the latter fall out.<sup>15</sup>

The other two lines of the synchronic generalization (5) are irrelevant for Common Slavic and Havlík's Law since Common Slavic lacked

<sup>15</sup> The philological approach is exposed in, among others, Koschmieder (1958), Panzer (1991: 277ff), Vaillant (1950: 124ff), Trávníček (1935: 46ff), Lamprecht (1987: 137ff), Lamprecht et al. (1986: 46ff), Nahtigal (1961: 96f), Liewehr (1933: 91ff), Carlton (1991: 165ff).

closed syllables altogether: all CS words end in a vowel, and the only sequence of consonants are of rising sonority, hence Onset-clusters.<sup>16</sup>

The move that was taken by Lightner's Lower thus makes the underlying structure of modern Slavic languages look like Common Slavic: all words end in a vowel (words that are C-final on the surface possess an underlying word-final yer with morphological value), and Codas do not exist in alternation-environments (Coda-clusters are separated by a yer in underlying representations).

Consequently, Lightner assimilates the grammar of modern Slavic languages to Havlík's Law in yet another respect: Lower does away with any reference to closed syllables. The only parameter driving yer vocalization is the presence or absence of a yer in the following syllable.

So why are Lower and Havlík's Law different with respect to directionality (cyclicity) and the mention of odd and even numbers? The answer is given in table (3), the relevant parts of which are repeated in (9) for convenience.

(9) vocalization in open syllables: diachronic situation

		open syllable zero		closed syllable vowel						
		C	C-V	C	C- <i>yer</i> CV	C	C- <i>ø</i>	C	C-CV	
Czech		dom- <i>ø</i> k-u		OCz dom- <i>øč</i> -ek- <i>ø</i>		domek- <i>ø</i>		dom- <i>eč</i> - <i>ø</i> k-u		gloss house dim.GENsg, double dim. NOMsg, dim. NOMsg, double dim. GENsg
				ModCz dom- <i>eč</i> -ek- <i>ø</i>						

All historical grammars report that Havlík's Law correctly describes the state of affairs in the old languages (Old Czech etc.) that have continued Common Slavic, but that "secondary vocalizations" have disturbed the picture. The forms at stake are precisely those of the offending second column where a CS yer-chain has been reduced according to Havlík's Law: CS dom-*ьč*-*ь*k-*ь* > OCz dom-*øč*-ek-*ø* > ModCz dom-*eč*-ek-*ø*. The second yer is even and thus weak. It should fall out, which it does in Old Czech, but is "restored" in Modern Czech. Philologists always invoke analogy in order to explain this "secondary vocalization" of weak yers, see e.g. Trávníček (1935: 47), Komárek (1962: 48),

<sup>16</sup> See e.g. Carlton (1991: 100ff), Vaillant (1950: 284ff).

Liewehr (1933: 98), Vondrák (1924: 180). However, given the absolute regularity of statement (4) "alternation-sites are vocalized in open syllables iff the following vowel alternates with zero itself", the analogization of the entire language according to a perfectly defined phonological parameter can hardly be taken seriously.<sup>17</sup> Assuming analogical activity in this case is even more absurd when considering the fact that several modern languages have employed exactly the same "secondary vocalization" of yers in identical conditions, cf. (3). One of the challenges of this paper is to seek an explanation for this fact which is not lexical, analogical and accidental, but phonological.

The "secondary vocalization" discussed is the real difference between Lightner and Havlík: two consecutive yers are never both vocalized in the regularity described by the latter, but do both appear on the surface in the generalization formulated by the former. Both statements describe realities which are slightly different but share the feature of solely depending on the presence vs. absence of a yer in the following syllable. No other parameter of any kind influences either Havlík's Law nor Lower (directionality (cyclicity) and odd-/even-numberedness also define the relation with the following yer).

It appears that Lightner has simply made Common Slavic the underlying structure of modern Slavic languages, and adjusted Havlík's Law according to the "secondary vocalizations" discussed. This move was common practice in early generative work: the representations that were assumed to be synchronically underlying coincide with earlier stages of the language.<sup>18</sup> Before we can concentrate on the crucial importance of

<sup>17</sup> To the best of my knowledge, there is only one root in Czech that disregards the generalization expressed in (4), i.e. where yers still alternate according to Havlík in the modern language: *šev* "seam", which derives *šv-ec* and not *\*šev-ec* "shoemaker", the genitive of which is *šev-*ø*c-e*. This hapax is always used in diachronic textbooks in order to show the modern reality of Havlík's Law, cf. for instance Lamprecht et al. (1986: 47), Trávníček (1935: 46), Liewehr (1933: 95).

<sup>18</sup> Theodore Lightner was a specialist in this kind of analysis, which he drove to absurd extremes for other Indo-European languages. In his view, English for example is derived synchronically by the application of Grimm's Law, Verner's Law and subsequent modifications setting it apart from continental Germanic (e.g.

Lightner's proposal for the purpose of this paper, some more diachronic information needs to be introduced in the next section.

#### 2.4. The difference between triggering and alternating yers

We have seen in section 2.2 that yers may have two destinies: either they become vocalized, or they are deleted. In both cases, they are an instance of what has been called an absolute neutralization (e.g. Kiparsky 1968, 1982, Kenstowicz & Kissseberth 1977: 1-62, Tranel 1981), that is the existence of an underlying object that never appears on the surface. Indeed, if yers are affected by vocalization, Lower transforms their initial yer-identity into a vowel that is part of the surface-inventory of the particular language. If on the other hand they are subject to deletion, they exist only in order to perform an action in the course of the derivation (triggering the vocalization of a preceding yer), but have no phonetic representative.

On these grounds alone, it is obvious that "the yers" do not constitute a homogeneous group of vowels, but fall into two categories: the ones that appear on the surface, and the ones that may never be observed as a phonetic object. In fact, this division has already been made at the end of section 2.2 when the question of how yers may be detected was addressed: recall that a yer exists underlyingly 1) in the location where a vowel alternates with zero, and 2) to the right-hand side of the consonant following an alternation site.

The former category may be called alternating, the latter triggering yers. We will see in the present section that this fundamental distinction also enjoys a diachronic reality. More synchronic evidence in support of it will be adduced in section 3 below.

A certain part of the philological literature, as well as courses in historical Slavic phonology, hold that alternating vowels in modern languages always go back to yers: if a vowel alternates with zero, it was

*tooth* and *dental*, *foot* and *pedal*, *detonation* and *thunder*, *torrid* and *thirst*, respectively, derive from the same synchronically underlying representation), see for example Lightner (1981).

a yer in Common Slavic. This is a myth.<sup>19</sup> An alternating vowel in a modern Slavic language may have two CS sources: 1) a yer or 2) nothing. In other words, some modern alternating vowels were born through epenthesis. The yer-origin does not need specific illustration; relevant evidence from Czech regarding the epenthetic origin is shown in (10), where the group of words concerned is identified according to the traditional classification of stems that relies on the thematic vowel in Indo-European.

#### (10) epenthesis of "yers"

##### a. feminine -i stems in NOMsg<sup>20</sup>

CS case-suffix -ь cause: loss of a yer in the following syllable

Modern Czech		Common Slavic
píseň - písøn-ě	"song NOMsg, GENsg"	NOMsg *pě-sn-ь
báseň - básøn-ě	"poem NOMsg, GENsg"	NOMsg *ba-sn-ь

##### b. neuter o-stems and feminine a-stems, both in GENpl<sup>21</sup>

CS case-suffix -ь cause: loss of a yer in the following syllable

Modern Czech		Common Slavic
číslo - o - čisel	n. "number NOMsg, GENpl"	GENpl *čl-sl-ь
sester - a - sester	f. "sister NOMsg, GENsg"	GENpl *sestr-ь

<sup>19</sup> Which is provoked by the antipathy of philologists against non-etymological objects. See Scheer (1996: 92ff) for discussion. Even though diachronic grammars such as Gebauer (1894-98 I: 154ff), Trávníček (1935: 230), Trávníček (1948-49 I: 41ff), Havránek & Jedlička (1963: 31) clearly expose the fact that alternating vowels may originate either in a yer or in epenthesis, the same authors sometimes invoke yers or resort to analogical explanations in order to be able not to refer to an object that is bare of any etymological existence. For GENpl forms, instead of acknowledging epenthesis, Gebauer (1894-98 I: 160), Gebauer (1894-98 II: 139ff), Trávníček (1935: 230), Lamprecht (1987: 138) and Komárek (1962: 150) for example invoke analogy with yer-bearing items.

<sup>20</sup> For more material on feminine i-stems, see for example Vážný (1963: 73ff), Vondrák (1906: 478ff), Trávníček (1948-49 I: 43), Trávníček (1935: 230), Gebauer (1894-98 I: 160ff), Gebauer (1894-98 II: 343ff), Arumaa (1985: 49ff, 120ff), Havránek & Jedlička (1963: 149ff), Vaillant (1958: 142ff).

<sup>21</sup> On epenthetic vowels in genitive plural forms, see e.g. Gebauer (1894-98 I: 160, 165), Gebauer (1894-98 II: 139ff), Panzer (1991: 324), Vážný (1963: 45, 61ff), Trávníček (1948-49 I: 44), Trávníček (1935: 230), Arumaa (1985: 68ff, 141f), Lamprecht (1987: 138), Komárek (1962: 128f, 150), Vaillant (1958: 35f).



cable.<sup>25</sup> I will come back to the phonological interpretation of the version of Havlík's Law that suits Czech in section 6.4.

This having been clarified, let us return to the main purpose of this section: alternating vs. triggering yers. We have observed that alternating yers are not always etymologically real; they may go back to an etymologically present vowel, or to nothing. By contrast, triggering yers have only a single source: yers. In all instances that have been reviewed above, the case-marker that triggers the vocalization of the preceding empty Nucleus is a yer (NOMsg of fem i-stems and masc o-stems, GENpl of fem a-stems and neuter o-stems). The synchronic assumption that word-final yers are actual case-markers (Gussmann 1980: 36ff, Rubach 1984: 41ff) is a diachronic reality.

It is therefore correct to say that the contrast between alternating and triggering yers that has been established on purely synchronic grounds is paralleled in diachrony. Furthermore, viewing the modern alternations as a simple reflex of the diachronic situation is necessarily erroneous: the object called "yer" that we deal with in the formulation of Lightner's Lower is different from the historical vowels Ъ,ь that occurred in Common Slavic. Lower includes etymological "nothings", whereas historical yers do not. The yers that are supposed to have a modern existence in underlying representations are abstract theoretical vowels (Gussmann 1980, Rubach 1984: 28) rather than the modern version of a diachronic reality.

### 2.5. Slavic vowel-zero alternations are caused by a syntagmatic relation

There is a crucial difference between Lightner's analysis that resorts to "invisible" yers and the distribution (5) that is read off the surface. In the latter view, the reason why vowels alternate with zero is of paradigmatic nature: syllable structure determines whether an alternation site is vocalized or not; in a closed syllable, vowels occur, while nothing is

<sup>25</sup> For example in Polish: pol. NOMsg *siostra* – GENpl *sióstr* = cz. *sestra* – *sester*; pol. *baśń* = cz. *báseň*, etc.

visible in open syllables (provided the following vowel does not alternate with zero itself). By contrast, Lower denies any causal relation between syllable structure and the vocalization of alternation sites: the **only** information that is needed in order to calculate the phonetic value of alternation sites is of syntagmatic kind. Either the vowel on the righthand side is a yer, or it is not. If it is, the alternation site is vocalized, if it is not, the site remains phonetically vacuous. This situation is summarized in (12) below.

- (12) Lower is entirely independent from syllable structure
- a. vowel-zero alternations are not triggered by the presence or absence of a consonant in a given syllable (Coda-analysis), but by an **intervocalic communication**.
  - b. this intervocalic communication involves two yers.

We will see in sections five and six in what way this statement is important for phonological theory. Before moving on to other relevant phenomena that do not involve vowel-zero alternations, it remains to be seen how autosegmental representations have affected Lower.

### 2.6. Autosegmentalized Lower

Lower and its presuppositions have been subject to substantial modifications in the mid-80s when autosegmental representations became a settled part of phonological theory. The autosegmentalization of Lower has been employed in Spencer (1986), Rubach (1986) and Kenstowicz & Rubach (1987).<sup>26</sup> For the sake of argument, the first paper mentioned will not be discussed in the present section. It will be introduced in section 5.4 below.

Recall from section 2.2 that the distribution of alternating yers is unpredictable. Their occurrence in a root or a morpheme is a lexical property of every single item. In nonautosegmental terms, the only way to express that two vowels are different in underlying representations is to

<sup>26</sup> Further exploration of the line defined in the two latter articles may be found in Rubach & Booij (1990a, b).

make them different in quality. Hence, in a six-vowel system such as the one encountered in Polish ([i, u, ɨ, ɛ, ɔ, a]), two yers need to be implemented, and their melodic properties must not coincide with any of the six vowels shown. The traditional solution was to make yers high vowels for historical reasons, but which were attributed a [-tense] feature that made them stand apart from the other three high vowels. Polish was thus believed to possess no less than five high vowels: (/i, u, ɨ, ɨ̄, ɛ, ɔ, a/).<sup>27</sup>

In autosegmental representations, a vowel that enjoys phonetic expression is defined as the association of a melodic identity (feature-bundle) with an x-slot dominated by a syllabic constituent. If there is an x-slot but no melody, nothing is heard (empty Onset or Nucleus); if there is a melody available but no x-slot, no phonetic trace of this melody will appear (e.g. latent consonants in French); and finally, if both melody and x-slot are present but remain unassociated, nothing is heard either. These basic principles of autosegmentalism do not need to be motivated, any textbook provides ample illustration.

As a consequence, there is another way of making yers different from other vowels: their peculiar properties may be encoded structurally rather than melodically. It was not a very lucky move anyway to attribute the specific phonotactic behaviour of yers (the fact that they alternate with zero due to a communication with a following vowel) to a melodic property (the fact of being [-tense]). The alternative explored by Rubach (1986) and Kenstowicz & Rubach (1987) grants a melodic, but no skeletal identity to yers: yers are floating melodies that do not possess a skeletal anchor. The ensuing underlying representations are given under (13) below for the three distributional situations, exemplified by the familiar Czech data.

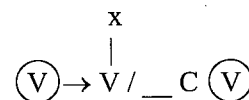
(13) Czech "elbow"

a. lokt-e GENsg	b. loket NOMsg	c. loket-ní adjective
x x x x x	x x x x	x x x x x x
l o k e t e	l o k e t e	l o k e t e n í

<sup>27</sup> The exact situation is even slightly more complicated, see Gussmann (1980: 63ff), Rubach (1984: 27ff, 139ff).

This move offers several advantages. First, there is no need anymore to locate the melodic identity of the yers in the high zone. Yers and non-alternating [ɛ,ɔ] are identical as far as melody is concerned. The only difference comes from the fact that the latter are associated to a skeletal slot, while no skeletal slot dominates the former (observe the difference between the two "e"s in (13)a). Hence, all the acrobatics related to the feature [tense] can be dispensed with, and the Polish vowel system is driven back to normal: there are only six distinct underlying vowels. Another advantage is that the rule of yer deletion that was needed before is superfluous: the phonetic absence of unassociated melodic material is in-built in the autosegmental frame (stray erasure). And finally, vowels that alternate with zero are predicted not to be subject to any melodic restriction anymore: in the earlier system working with two yers, at most two distinct vowels on the surface could alternate with zero (as is the case in Eastern Slavic). But what about languages like Slovak where more than two vowels behave in this way? Relevant alternations are reported by Rubach (1993: 139ff): *o*-zero *bahor* – *bahra* "belly NOMsg, GENsg", *e*-zero *šev* – *švu* "seam NOMsg, GENsg", *a*-zero *jedlo* – *jedál* "food NOMsg, GENpl". In autosegmental terms, the associated representations are straightforward: whatever vowel alternates with zero, its underlying representation is simply its floating melodic identity, without a skeletal slot. Any alternating vowel will thereby be different from its melodically identical peer that does not alternate because the latter is associated to a skeletal slot. The autosegmental expression of Lower, then, takes the following shape (Rubach 1986, Kenstowicz & Rubach 1987).

(14) Lower autosegmentalized



Yers are circled. A skeletal slot is associated to a yer iff this yer is followed by one consonant and another yer. The cyclic application of the autosegmentalized version of Lower transforms the underlying floating melodies of (13) into the attested surface forms, and promotes to a phonetic existence all members of a chain of yers except the final one.

A word like pol. *pieseczek* “dog double diminutive” hosts four yers in a row in its underlying structure: /pies-ocz-ek-o/ (yers are underscored, the difference between *e*- and *o*-yers follows from their palatalizing effects).

This is as far as the analysis of vowel-zero alternations in Slavic languages has been developed until the beginning of the 90s. With minor revisions, the core of the reasoning still stands up to present day analysis. In the next section, I will try to build on these results and propose their generalization first to other phenomena known from Slavic, then to other languages.

### 3. Yers all over the place in Slavic?

The evidence that has led Lightner, Gussmann, Rubach and others to seek a non-disjunctive analysis of Slavic vowel-zero alternations is compelling: there is only one single cause for the appearance of a yer, i.e. the existence of a yer in the following syllable. The cornerstone of the entire venture that allows for the excellent insight and the elegant demonstrations mentioned has been pinpointed in section 2.5: Slavic vowel-zero alternations have got nothing to do with syllable structure; they are the consequence of an intervocalic relation between two yers.

In the following discussion, I show that the disjunctive context (5) “in closed syllables and in open syllables if the following vowel is a yer”, which is at the origin of Lower, also controls other alternations in Slavic. As a matter of fact, it even occurs massively in non-Slavic languages. The empirical record thereby established will then be confronted with phonological interpretation in section 4.

Let us begin with four well-known segmental events from Czech and Polish where different melodic effects are conditioned by a unique context, namely the one stated in (5) above. Relevant data appear below.<sup>28</sup>

<sup>28</sup> Spelling: an acute accent or a little circle over the u (“ů”) notes vowel-length in Czech. Czech ž, y = [ʒ, i]. Polish “ó” is [u], and a hook under a vowel denotes its nasal character, whereby ą = nasal [ɔ] and ę = nasal [ɛ]. The phonetic value of

- (15) the distributional pattern “in closed syllables and in open syllables if the following vowel is a yer” (5) extends beyond vowel-zero alternations

	open syllable		closed syllable		gloss
	C_C-V	C_C-yer	C_C-ø	C_C-CV	
a. Czech VV-V	žáb-a	žabek-ø	žab-ø	žab-øk-a	frog NOMsg, dim. GENpl, GENpl, dim. NOMsg
	jmén-o	jmen-ný	jmen-ø		name NOMsg, adj., GENpl
b. Czech ů-o	nož-e	nůž-ek-ø	nůž-ø	nůž-øk-y	knife GENsg, scissors (=dim.) GENpl, knife NOMsg, scissors NOMpl
c. Polish ó-o	krov-a	krów-ek-ø	krów-ø	krów-øk-a	cow NOMsg, dim. GENpl, GENpl, dim. NOMsg
d. Polish ą-ę	zęb-a	ząb-ek	ząb-ø	ząb-øk-a	tooth GENpl, dim. NOMsg, NOMsg, dim. GENsg

#### 3.1. Czech alternations in vowel length

In (15)a, an alternation in vowel length is shown that is typical for Czech.<sup>29</sup> The distribution of long and short vowels is constant in the

nasal vowels in Polish depends on the following segment. Roughly, [ɛN], [ɔN] appear before a stop (“N” is a homorganic nasal consonant that shares place with the stop), while [ɛ̃w̃], [ɔ̃w̃] surface elsewhere. See e.g. Ostaszewska & Tambor (2000: 53ff), Nagórko (1998: 35ff) for a more detailed description. The allophony at hand is of no relevance for the present discussion.

<sup>29</sup> Vowel length is a century-old problem in Czech, see e.g. Černý (1897), Trávníček (1921, 1948-49 I: 201ff). There is no general distributional pattern for the entire language, regularities only hold within certain morphologically defined paradigms. It is shown in Scheer (2001a, b) that the lion’s share of the length alternations is templatic in the Semitic sense. The alternations discussed must be kept apart from those produced by another category of diminutives, which produces opposite results (*vlak-vláč-ek* “train, dim”). More examples of the paradigm illustrated by *žába* are (NOMsg – GENpl – suffix – CV): *bába-bab-babka* “old woman”, *blána-blan-blanka* “membrane”, *brána-bran-branka* “gate”, *pára-par-parní* (adj) “steam”, *skála-skál-skalka* “rock”, *kráva-krav-kravka* “cow”, *lipa-lip-lipka* “lime tree”, *сила-sil-silný* (adj) “strength”, *vila-vilnice-vilnost* “nymph, lascivious woman, voluptuousness”, *víra-ver-vernost* “faith”,



paradigm mentioned, i.e. feminine a-stems and neuter o-stems to which yer-initial suffixes such as the diminutive *-ek* and the adjectival *-ný* are attached. The presence of a yer is guaranteed by the vowel-zero alternation observed in *žab-øk-a - žab-ek* “frog diminutive NOMsg, GENpl”. We also know from so called short adjectives that occur in predicative function where the case marker *-ý* is absent that the adjectival *-ný* in fact is yer-initial: *nemoc-øný - nemoc-en* “ill long, short form”. On the other hand, it was established earlier that all words that are phonetically consonant-final end in a yer. Hence, abstracting away from vowel-length, the underlying representations of *žába, žabek, žab, žabka, jméno, jmen-ný, jmen* are /žab-a, žab-ɪk-ɪ, žab-ɪ, žab-ɪk-a, jmen-o, jmen-ɪn-ý, jmen-ɪ/, respectively.

If the distribution of long and short vowels that occur in the root were to be characterized without recurring to yers, the correct statement would be “long vowels occur in open syllables if the following vowel does not alternate with zero, whereas short vowels occur in closed syllables and in open syllables if the following vowel alternates with zero”. That is, the distribution of vowel length is exactly identical with the pattern of vowel-zero alternations extracted in (5): long vowels appear in the same environment as zeros, short vowels exist in the same context as vowels.

Who could believe that this identical behaviour is accidental? We have good reason to think that it is not. Consequently, the usual Closed Syllable Shortening-analysis that phonologists are tempted to apply in these circumstances<sup>30</sup> cannot cope with the Czech alternation shown, for the same reason that the Closed Syllable analysis had to be abandoned when vowel-zero alternations were at stake: saying that short vowels

*léto-let-letní* (adj) “summer”, *houba-hub-hubka* “mushroom”, *louka-luk-luční* “meadow”, *smlouva-smluv-smluvní* “contract”. See Scheer (2001a, b) for more material.

<sup>30</sup> Closed Syllable Shortening is a process whereby underlyingly long vowels are forced to shorten because a Rhyme must not dominate more than two skeletal slots (either a simplex Nucleus and a Coda, or a branching Nucleus), ruling out thereby rhymal sequences of a long vowel and a Coda. See orthodox textbook evidence such as Spencer (1996: 85ff), Harris (1994: 78ff), Kenstowicz (1994: 436ff, 646ff).

occur in closed syllables is contrary to fact because they appear in open syllables if the following vowel alternates with zero.

By contrast, the analysis becomes simple and non-disjunctive if yers are invoked: short vowels occur before yers, while their long versions appear before other vowels. In spite of this striking identity in the triggering environment, we cannot apply Lower to these data, be it in its linear or autosegmental flavour. Indeed, the triggering conditions are identical, but the effects are very different: vocalization in one case, shortening in the other.

Let us leave this issue open for the time being. Before we can push the discussion further, the other alternations mentioned in (15) call for examination.

### 3.2. Czech and Polish [ɔ] – [u(u)], Polish “ą”-“ę”

In both Czech and Polish, [ɔ] alternates with [u(u)]. This phenomenon is sometimes referred to as “raising”. In Czech, the alternation in quality is accompanied by length: [ɔ] is short, while [uu] is long; the former is spelt “o”, the latter “ů”. In Polish where length is not contrastive, [ɔ] = “o” alternates with [u], which is spelt “ó”. This way, Polish spelling differentiates [u] that alternates with [ɔ] from [u] that does not: the former is written “ó”, the latter “u”. The relevant data are given in (15)b and (15)c.

Both Czech and Polish alternations are governed by the same contextual conditions (5) that do not need to be commented anymore: [u(u)] occurs in closed syllables, and in open syllables if the following vowel alternates with zero. On the other hand, [ɔ] appears in open syllables if the following vowel does not alternate with zero.<sup>31</sup> This statement can be

<sup>31</sup> The majority of Czech roots that show the “o” – “ů” alternation does in fact react on yers: *dům-domek* “house, id. diminutive”, *stůl-stolek* “table, id. diminutive”, etc. The cases where yers are treated as regular vowels seem to be those where the form that contains the vocalized form of the yer is the Nominative singular. Feminine nouns that show the vocalized yer in GENpl forms bear the unaltered “ů”: *nůž-øk-y-nůž-ek* “scissors NOMpl, GENpl”, *hůl-øk-a-hůl-ek* “little stick NOMsg, GENpl”, *půl-øk-a-půl-ek* “half NOMsg, GENpl”. There is no hope

recast in non-disjunctive fashion as before if yers are assumed. Their motivation can be read off the data in the way that is familiar by now.<sup>32</sup>

We certainly do not deal with two separate phenomena here. Rather, there is one single event that has a Polish and a Czech manifestation (and is also present in neighbouring areas). Spelling in both languages hints to the common origin: the [u(u)] is fake, its real identity is [ɔ]. The Polish symbol “ó” betrays this source overtly, and so does the Czech “ů”: the little circle over the “u” (*kroužek*) reminds that the “u” in question comes from an [ɔ] (long [uu] that has never been [ɔɔ] is written “ů”).

Another important factor is that this alternation occurs only if the following consonant is voiced. In Czech, this is true for the entire set of alternating roots (20 items). Polish possesses many more alternating roots, and some of them have a voiceless consonant following the “ó”, e.g. *powrót – powrotu* “return NOMsg, GENsg”.

Place restrictions preclude further discussion of this alternation. In its original form, short [ɔ] was lengthened iff it occurred 1) word-finally and 2) before a voiced consonant. This statement is true for Old Polish (where vowel length was contrastive) and Old Czech.<sup>33</sup> Later on, long [ɔɔ] was raised to “ů”/“ó” = [u] in both languages, and Polish lost distinctive length. In any event, the diachronic scenario shown above does not

to tell both sets from each other on phonological grounds. Whatever the solution, it does not bear on the demonstration.

<sup>32</sup> The Czech side is discussed in, among others, Lamprecht et al. (1986: 113), Trávníček (1935: 82ff), Komárek (1962: 169f). For the Polish part, see Gussmann (1980: 53f, 113ff) who is explicit on the triggering yer context (5), Szpyra (1989: 160ff, 1992: 288ff), Rubach & Booij (1987: 10f) who are mistaken in denying its relevance. See also Grzegorzczkova et al. (1999: 114ff) for a descriptive survey. Exhaustive data for Czech are available in Scheer (2001a), where the diachronic identity of the alternation is established.

<sup>33</sup> Pedersen (1905: 305) for example discusses the diachronic identity of both alternations involving [ɔ] (nasal or not) in both languages: [ɔ] > [ɔɔ] / \_\_C +voice#. The existence of many non-alternating stems that do meet the contextual conditions in both languages and for both alternations [ɔ]-[u(u)] and “ę”-“ą” also shows that the phonological process at stake is not synchronically active, but occurred in a former (common) stage of Polish and Czech.

explain why lengthening did not take place before regular vowels, but did occur before yers. Whatever the status of this alternation, synchronic or diachronic, involving vowel-quality or vowel quantity (or both), it exists and is (or has been) triggered by the context that is of interest here.

The alternation shown in (15)d that concerns the two nasal vowels in Polish (sometimes called “Nasal Backing”) belongs to the same family: it may be traced back to a diachronic reality (that is Old Polish in this case) where short nasal *o* was lengthened iff it occurred 1) word-finally and 2) before a voiced consonant. Later on, an independent diachronic event turned short nasal *o* into nasal *e* = “ę”, and then contrastive length was abandoned.<sup>34</sup> The same remarks apply as before: this diachronic scenario does not explain why yers do not behave like regular vowels. Moreover, the status of this alternation in the synchronic grammar of the speakers is not clear either. However, these remarks do not harm the relevance of the familiar conditioning context (5) that is recurrent once more.

### 3.3. Summary

The table in (16) gives a summary of the four phenomena examined, that are controlled by the same context as vowel-zero alternations. It

<sup>34</sup> See for example Stieber (1973), Carlton (1991: 128f) for a summary of the diachronic situation of Polish nasal vowels. Gussmann (1980: 54, 84ff), Rubach (1984: 130ff, 229f), Szpyra (1989: 163ff, 1995: 104), and Bethin (1992) provide exhaustive synchronic data. It is interesting to observe that most authors hint at the close relationship between the alternations involving “ę”-“ą” and “o”-“ó” because of the identical triggering context (5), but do not link them to vowel-zero alternations even though these are governed by the same contextual conditions. Since Rubach (1986) and Kenstowicz & Rubach (1987), the fact that yers “are invisible” for syllable-based processes (such as comparative and imperative allomorphy and lotation) has been a standard argument for their representation as a floating matrix (lacking any X-slot, rather than as an empty Nucleus). Szpyra (1992: 288ff, 1995: 105ff) argues that both alternations concerning “ę”-“ą” and “o”-“ó” fall into this category, but rejects a causal relation between their distribution and the existence of a yer in the following syllable. However, she convincingly moderates the orthodox statement to the effect that while yers fail to be syllabified, they block the tautosyllabicity of flanking consonants that qualify as branching Onsets.

supposes that Polish/Czech [ɔ]-[u(u)] and Polish “ą”-“ę” are traced back correctly to their historical identity: the three variations at hand are alternations in vowel length that have been coloured by secondary processes such as raising ([ɔɔ]>[uu]), “ą”>“ę” and the loss of contrastive length in Polish. I wish to insist on the fact that this diachronic interpretation makes no statement concerning the cognitive reality of the processes mentioned in the synchronic grammar of speakers.

(16)

alternation	object occurring in		example	
	__CV	__Cyer	__CV	__Cyer
vowel-zero	zero	vowel	dom-ɔk-u	dom-ek, dom-eč-ek, dom-eč-ɔk-u
Czech vowel length	VV	V	žáb-a	žab, žab-ek, žab-ɔk-a
	V	VV		
Polish o-ó	o	[ɔɔ] / __C <sub>+voice</sub> # (> [uu] > [u]=ó)	krow-a	krów, krów-ek, krów-ɔk-a
Czech o-ů	o	[ɔɔ] / __C <sub>+voice</sub> # (> [uu]=ů)	nož-e	nůž, nůž-ɔk-y, nůž-ek
Polish ą-ę	ą (> ę)	ąą / __C <sub>+voice</sub> # (> ą)	zęb-a	ząb, ząb-ek, ząb-ɔk-a

This table immediately raises a question: how can long vowels be provoked by the fact that there is no yer in the following syllable in one case (Czech vowel-length), and by its opposite context in the others (Polish/Czech [ɔ]-[u(u)], Polish “ą”-“ę”)? In order to understand this distribution, we must first know what kind of causality is expressed by the statement “before a word-final voiced consonant.” The three latter alternations are indeed controlled by three parameters: 1) presence vs. absence of a yer in the following syllable; 2) presence of a voiced consonant to their right-hand side; 3) the fact that this voiced consonant is word-final. Unless the interplay of these three conditioning factors is properly understood, the initial question cannot be expected to be solved. This

issue is too ambitious for the present paper, and I will not discuss it in any further detail.

In absence of better evidence, the Czech alternations in vowel length (*žába-žab*) that are free from any additional conditioning factor have to be taken as the unmarked case. I will come back to this issue in section 5.1.

For the time being, we can close this section on the following observation, which is its actual goal: yers condition a variety of segmental alternations in the preceding syllable, among them vowel-zero alternations and vowel length. However, Lower in its initial or autosegmental formulation aims only at describing the influence of yers on preceding vowel-zero alternations, i.e. the relation between two yers. The fact that vowel length obeys exactly the same pattern as vowel-zero alternations (5) suggests that this ambition is too narrow: a more general formulation of what yers can do to vowels in the preceding syllable is called for.

Moreover, the theory-internal and diachronic motivation for the fundamental difference of triggering and alternating yers is now enriched by an overt distinction. It is incorrect to say that yers have influence on other yers only. Rather, vocalic alternations in Slavic languages are triggered by yers. Yers condition vowels that occur in the preceding syllable. Target vowels may be yers themselves (vowel-zero alternations), but also regular vowels (length alternations). If the identity of the context governing vowel-zero alternations and those involving vowel length is not accidental, the generalization in order may not be achieved through the yer-vocalization rule Lower. Rather, it is of more general intervocalic nature. This intervocalic relation does not necessarily target a yer, but it necessarily originates in a yer. Triggering and alternating yers are different.

In the next section, we will see how the familiar yer context extends beyond Slavic.

#### 4. Yers all over the world?

In this section, two more occurrences of the yer-context (5) are reviewed: French ATR-alternations and alternations involving schwa [ə]

and [ɛ] in the same language. French possesses six mid vowels that subdivide into two sets: +ATR [e, o, ø] and -ATR [ɛ, ɔ, œ].<sup>35</sup> ATRness is distributed according to the familiar yer-context: [+ATR] versions occur in open syllables if the following vowel does not alternate with zero, while mid vowels are [-ATR] in closed syllables and in open syllables if the following vowel alternates with zero. Since Dell (1973), this pattern is usually referred to as "Closed Syllable Adjustment" or "Loi de Position" in the relevant literature.<sup>36</sup>

In French, the only vowel that alternates with zero is schwa [ə]. Unlike in Slavic, this alternation is not obligatory but optional, thus *la semaine* "the week" may be pronounced as either [la səmən] or as [la sɔmən], depending on dialectal, sociological, and idiolectal parameters.<sup>37</sup>

Table (17) illustrates this description.

Is it reasonable to suppose that the distribution of French ATRness, Slavic vowel-zero alternations and Czech alternations in vowel length is exactly identical by accident? If it is not, we should recast the statement "[ATR] vowels occur in closed syllables or in open syllables if the following vowel is a schwa" as "mid vowels are [-ATR] iff a yer occurs in the next syllable". Hence, should we conclude that there are yers in French? The answer to that question probably depends on the definition of the word "yer": if a "yer" is a high centralized lax vowel with either a palatal or a velar flavour that underlies vowel-zero alternations and corresponds to Indo-European *i* and *u*, respectively, there is no doubt that we

<sup>35</sup> In Northern French (Paris), realizations in open syllables are floating and inconsistent (both [fete] and [fɛte] may be produced for *fêter* "to party" by the same speaker in free variation). In the South on the other hand, ATRness is constant and subject to no kind of free variation (only [fete] is possible for *fêter*). In closed syllables such as [fɛt] *je fête* "I party", mid vowels are always [-ATR] in both northern and southern varieties. The following discussion addresses the southern pronunciation.

<sup>36</sup> See for example Dell (1973: 209ff), Selkirk (1972: 367ff), Schane (1968: 30ff), Valdman (1972), Morin (1986, 1988), Tranel (1987, 1988).

<sup>37</sup> Dell (1973: 219ff) and many others expose the general facts about schwa-zero alternations in French.

(17) French ATR-alternations of mid vowels

	closed syllable		open syllable			
	_C#	_C.CV	_Ca	_CV		
e	fɛt	alɛχte	sɛlœri	fete	je fête, alerter, céleri, fêter	I party, alert, celery, to party
	metχ	pɛχdy	bɛtœvɑv	metχik	mètre, perdu, betterave, métrique	metr, lost, turnip, metrical
	sœvɛn		sœvɛnɔmā	sœvɛnite	sereine, sereinement, sérénité	serene, serenely, serenity
o	kɔd	porte	mɔkœri	kode	code, porter, moquerie, coder	code, carry, mockery, to code
	rɔz	normal	rɔzœvɛ	rozje	rose, normal, roseraie, rosier	rose, normal, rose garden, rose tree
	sɔbɪ		sɔbɪɔmā	sɔbrijete	sobre, sobrement, sobriété	sober, soberly, sobriety
ø	øvœz	œχte	øvœzɔmā	apœvɛ	heureuse, heurter, heureusement, apeuré	happy, happily, frightened
	œvɪ	sœχfɛ	bœvœri	øvre	œuvre, surfer, beuverie, œuvrer	work (opus), surf, boozing, to work
	ʒœn		vœlœri	ʒœnes	jeune, veulerie, jeunesse	young, weakness, youth

conclude on the absence of yers from French. No such objects are known in either French diachronic or synchronic analysis. If on the other hand yers are abstract theoretical vowels as is suggested by Gussmann (1980), Rubach (1984: 28) and at the end of section 2.4, the answer may be positive. If a Slavic word that is consonant-final on the surface can end in an abstract vowel underlyingly, there is no reason why a French word could not be analyzed this way, and for identical reasons.<sup>38</sup> Also, if an abstract vowel may occur after Codas in Slavic, it can do so in French as well. None of these abstract vowels ever surface in French, which means

<sup>38</sup> Interestingly, Dell (1995: 18ff) makes a parallel suggestion for the sake of entirely independent evidence.

that there are no closed syllables in the underlying structure of this language at all.<sup>39</sup>

The price to pay if this perspective should be rejected is high: 1) the analysis of French ATRness must cope with an unwarranted disjunction; 2) a generalization regarding this disjunction and its identical occurrence in Slavic would be missed; 3) the same effects would be ascribed to different causes.

Before evaluating the theoretical consequences of the presence of “yers” in French, let us briefly adduce a further piece of evidence in support of the reality of French “yers”. Another well-known alternation in French that is referred to as “Schwa-Adjustment (ə-AJ)” concerns schwa [ə] and [ɛ].<sup>40</sup> This alternation and the aforementioned ATR-variation are commonly assumed to be two effects of a single phonological mechanism called Closed Syllable Adjustment.<sup>41</sup>

Their distribution obeys the familiar pattern: schwa appears in open syllables if the following vowel is not a schwa itself, while [ɛ] is observed in closed syllables and in open syllables if the following vowel is a schwa. Table (18) embodies this statement.

Internal closed syllables (C.CV) are not represented because French morphology does not allow to produce C.CV-clusters where both consonants are heteromorphemic. On the other hand, schwa does not exist in closed syllables at all, and hence will never occur in roots that end in two consonants of falling sonority ↓ RT such as *alert-er*, *perd-re* “alert, lose”, etc. Relevant examples actually appear in table (17).

<sup>39</sup> The attentive reader will have noticed that there is a difference between Slavic vowel-zero alternations and French ATR: in the former case, yers after Codas always enjoy additional motivation because they appear on the surface in the appropriate context (pol. *bul-ecz-øk-a* NOMsg vs. *bul-ecz-ek* GENpl). This is not the case in French: the inferred yer separating [r] and [d] in [perdy] *perdu* “lost” has a phonetic existence under no circumstances. This issue is further discussed in section 6.3.2.

<sup>40</sup> See for example Dell (1973: 198ff), Schane (1968: 30ff), Tranel (1987, 1988), Charette (1991: 172ff).

<sup>41</sup> See Tranel (1987, 1988), Morin (1988) for a more detailed comparison of both alternations and a survey of the relevant literature.

### (18) French schwa – [ɛ] alternation

closed syllable	open syllable			
	ɛC#	əCV		
mɔχsel	mɔχseləmə	mɔχsəl̩, mɔχsələ	1) je, tu, il, ils morcèle(s)(nt), 2) morcèlement, 3) nous morcelons, 4) inf./ part./ vous morceler/ -é/ -ez	1) cut into pieces 1sg; 2) id., noun; 3) cut into pieces 1pl; 4) id., infinitive
apɛl	apɛləra	apələ	j'appelle, appellera, appellation	call 1sg; id., future 3sg; id., infinitive
ãsoχsel	ãsoχseləmə	ãsoχsələ	j'ensorcèle etc., ensorcement, ensorceler etc.	bewitch 1sg; id., noun; id., infinitive
aχsel	aχseləmə	aχsələ	je harcèle etc., harcèlement, harcèler etc.	harass 1sg; id., noun; id., infinitive
aʃɛv	aʃɛvəmə	aʃəvə	j'achève etc., achèvement, achever etc.	achieve 1sg; id., noun; id., infinitive
sɛvʁ	sɛvʁəkə	səvʁə səvʁaʒ	elle sèvre, sèvrera, sevrer, sevrage	1) wean 1sg; 2) id., future 3sg; 3) id., infinitive; 4) id., noun

The two French alternations require yers so as to be understood as a non-disjunctive reality. In the next section, I inquire on the real phonological identity of what has been referred to as “yers” up to this point.

## 5. What an “abstract vowel” really is

### 5.1. The puzzle

Let us first assemble the pieces of the puzzle that have been collected in the previous sections. The environment (5) that I have been referring to as the “yer context” conditions the following alternations (“schwa” is shorthand for “vowel that alternates with zero”).

(19)

alter- nation	statement	object occurring in		example	
	surface	__CV if V≠schwa	closed syllable and CV if V=schwa	__CV	__Cyer
using yers		__CV	__Cyer		
Slavic vowel-zero	zero	vowel	dom-øk-u	dom-ek, dom-eč-ek, dom-eč-øk-u	
French schwa - [ɛ]	schwa	[ɛ]	[apɛl] <i>appelle</i>	[apøle] <i>appeler</i>	
Czech vowel length French ATR	VV +ATR	V -ATR	žáb-a [fɛt] <i>fête</i>	žab, žab-ek, žab-øk-a [fete] <i>fêter</i>	

residual: multiple parameters, to be understood				
	V	VV		
Polish o-ó	[ɔ]	[u]	krow-a	krów, krów-ek, krów-øk-a
Czech o-ů	[ɔ]	[uu]	nož-e	nůž, nůž-øk-y, nůž-ek
Polish ą-ę	ą (> ɛ)	ąą (> a)	zęb-a	ząb, ząb-ek, ząb-øk-a

As stated earlier, the alternations that I call “residual” exceed the scope of this paper. They appear for the sake of completeness.

The main part of the table is explicitly grouped: Slavic vowel-zero alternations go along with French schwa-[ɛ], while Czech alternations in vowel length are paired with French ATRness. This classification is made on purpose. It reflects the intuitive attribution of strength and weakness to the particular alternating items: in the former group, the objects that are relatively weaker with respect to their alternating variants (i.e. zero and schwa) appear before real vowels, while the stronger alternants (i.e. vowels and [ɛ]) occur before yers. By contrast, strong and weak alternants are flipped around in the second group: the strong long and [+ATR] vowels occur before real vowels, whereas their weak alternants (i.e. short and [-ATR] vowels) are observed before yers.

This situation seems contradictory: why should an identical context sometimes create the conditions for the appearance of strong allophones, but prohibit their existence in other instances?

This issue will be picked up again in section 6.5 once the theoretical tools for its understanding have been laid out.

## 5.2. Empty Nuclei prior to Government Phonology I: Stephen Anderson on French

A unique solution to the puzzle sketched was proposed by Anderson (1982) and Spencer (1986): “yers”, whose identity was supposed to be “abstract vowels” are in fact empty Nuclei. Both papers came to this conclusion in the same intellectual drive that was created by the advent of autosegmental structures, and they were motivated by the two sets of data that have been discussed above: French alternations involving schwa and Slavic vowel-zero alternations.

Let us first look at Anderson’s problem. He observes that the two French alternations exposed under (17) and (18) are conditioned by the same context and therefore wishes to conflate the corresponding rules into one. As for the alternation introduced in (18), what could be the underlying identity of the object whose surface-manifestations are [ɛ], [ø] and zero? As was mentioned above, schwa may be optionally realized as zero<sup>42</sup>, including instances where it alternates with [ɛ] as in *appelle* [apɛl] (the only possible realization) vs. *appeler* [apøle] or [aple]. However, the phonetic realization of schwa is most frequently not [ø], but [œ]. Since both [ɛ] and [œ] are also surface realizations of underlying objects that do not participate in the alternation schwa-[ɛ]-zero (e.g. *allaite* [alɛt] “give milk 1sg” – *allaiter* [alɛte], \*[aløte] “id., infinitive”; *abreuver* [abœvɛ] “give water (animal) inf.” vs. *abreuve* [abœvɛ], \*[abœvɛ] “id., 1sg”), neither /ɛ/ nor /schwa/ (= [ø] or [œ]) qualify for underlying representations (Anderson 1982: 544ff, 550). The third candidate, zero, does in principle.

<sup>42</sup> Subject to certain contextual conditions, see e.g. Dell (1973: 219ff).

But this option was excluded by Dell (1973: 187f) for a reason that is identical to the one that disqualified epenthesis strategies in Slavic (cf. section 2.2): in both Slavic and French, the occurrence of vowels that alternate with zero is a lexical property of each word and morpheme. It cannot be predicted from any environmental parameter. If zero were underlying in French, the two words *secouer* [səkwe] “to shake” and *skier* [skje] “to ski” would possess an identical underlying structure at their left margin: /#sk.../. Accordingly, either both forms are expected to surface with schwas, or none is.

This is where the title of Anderson’s (1982) article stems from: **How to get something for nothing**. In linear terms, the two insights that Anderson had made could not be married: melodically (or paradigmatically), the only possible underlying identity for the object at stake was zero: “nothing”; but structurally (or syntagmatically), the location of the same object had to be different from zero: “something”. However, autosegmental theory provided a natural solution to this equation: since the structural level is separated from the definition of melody, nothing prohibits the structural presence of the vocalic object sought, i.e. a Nucleus, which is melodically zero. On this account, schwas are different from any other vowel since they are the simple spell-out of an empty Nucleus (whereas stable [œ] is an underlying /œ/ which is already associated with its Nucleus in the lexicon), and their occurrence in the linear string is anchored in the lexicon.

Once this important step away from the unwarranted syllabic philosophy “What you get is what you see” is made, the question arises how these empty Nuclei come into segmental being in cases when they appear on the surface. Anderson works in a rule-ordering type of grammar that may be described as a version of SPE augmented with autosegmental representations. In this spirit, he operates with various linking and delinking rules. Namely, the segmental material attached to the Onset of an empty Nucleus is resyllabified as the Coda of the preceding syllable if and only if its original syllable containing the empty Nucleus does not bear a Coda (Anderson 1982: 553ff). This is Anderson’s way to encode the Closed Syllable condition: the Onset of a syllable whose Nucleus is

vacuous and that lacks a Coda is captured by the preceding syllable. Note that this move makes vowels come to stand in closed syllables that either have always been in that situation since the lexicon (such as /tɛt/ → [tɛt] *tête* “head” and /pɛr.dy/ → [pɛr.dy] *perdu* “lost” for ATR, /a.p\_l/<sup>43</sup> → [a.pɛl] *j’appelle* “I call” for schwa-[ɛ]), or whose Rhyme was adjoined a consonant through the capture of the Onset of the following syllable that bore an empty Nucleus (cases of /bɛ.t\_ɾav/ → [bɛt.ə.ɾav] *betterave* for ATR, /a.p\_l\_ra/ → [a.pɛl.ə.ɾa] *appellera* for schwa-[ɛ]). In this way, Anderson gets rid of the disjunction (5) “in closed syllables and in open syllables if the following syllable hosts a schwa”: something that behaves like a Coda (= the Onset of a schwa syllable) must be a Coda, and if it is not, we will make it a Coda.

Once this resyllabification has taken place, subsequent rules fill in the remaining empty Nuclei by [ɛ] if their Rhyme possesses a Coda, and mid [+ATR] vowels are turned into their [-ATR] variants under the same conditions. The remaining empty Nuclei that have not been filled by the [ɛ]-insertion rule (i.e. the ones whose Coda has been captured) are optionally deleted (according to the optional character of schwa in e.g. [apɛl(ə)ɾa] *il appellera* “he will call”). To be precise, Anderson proposes that the entire syllable, which does possess neither Onset-material nor a Coda, is deleted. When schwa is realized, the empty Nucleus of these remaining syllables is filled in by [ə]/[œ].<sup>44</sup>

### 5.3. Coda-capture vs. yers

The solution favoured by Anderson is typical of the early period of the generative endeavour: anything could be a rule and change any object into any other object, the only goal being to produce the attested result on

<sup>43</sup> I use the symbol “\_” in order to refer to empty Nuclei while maintaining the difference with “ø” which stands for the mid front rounded [+ATR] vowel.

<sup>44</sup> The optional character of the rule deleting syllables with empty Nuclei, as well as the exact ordering of rules, is inferred by me, Anderson (1982: 555f) is evasive on this topic.

the surface.<sup>45</sup> "Coda-capture", as practised here, is one case in point of this strategy whose ambition is to derive the attested forms rather than to understand which phonological (and hence biological) processes are involved. A substantial critique of this SPE-type of behaviour was available as early as in Foley (1977: 3ff). Since the concept of coda-capture has survived up to present-day phonology in different disguise, Harris (1999) has made clear one more time what it really is: an attempt to make fit into a theory a reality that is unpleasant. Some open syllables behave as if they were closed, so let us write a rule that makes them closed.

Doing this is sure to miss the insight of Lightner's Lower: the presence or absence of a Coda in a given Rhyme is completely irrelevant to the alternations governed by the yer context in (5). Rather than in the paradigmatic relation of a Nucleus and a Coda, the solution is to be sought in the syntagmatic communication between two vowels.

Apart from the formal properties that were mentioned and those that are to be exposed below, there is good reason to be surprised that the "French" reaction on the same object (5) that led to Lower on the "Slavic" side went the paradigmatic, rather than the syntagmatic way. Indeed, ever since French was dragged into the spotlight of modern and generative investigation by Schane (1968), all analyses resorted to a kind of word-final yers which occurred at the end of words that were consonant-final on the surface. These vowels were called "protective

<sup>45</sup> For the sake of fairness, this has not been Anderson's only motivation. He has also sought to connect his analysis based on coda-capture with other facts from French such as the ordering of other rules and *h-aspiré*. Another attempt at reducing the disjunction (5) was made by Selkirk (1978). She proposes that the relevant domain of application of the rule governing the alternations at hand is not the syllable, but the foot (see also Basbøll 1981 along these lines). Tranel (1987: 312f) has shown that this approach does not resist the French evidence. Moreover, it is transparent that the definition of a French foot as "containing one syllable, except if the following vowel is a schwa, in which case it contains two syllables", serves no other purpose than making the yer context (5) non-disjunctive. Schwa being drowned in the foot by force, the yer context can be recast as "everywhere but at the end of a foot". This procedure is overtly circular.

schwas". They are almost exactly parallel to the word-final triggering yers in function and behaviour: 1) they never reach the surface, 2) they exist in order to prevent (Slavic: in order to trigger) the application of rules, 3) they are assigned morphological value. For instance, first, second and third person singular of verbs belonging to the first group (infinitives in *-er* like *porter* "to carry") were said to be marked by /-ə/, the feminine marker of adjectives was /-ə/, and the thematic vowel of the first group of verbs was /-ə-/ as well. On the account of alternations between consonants and zero, consonant-deletion rules were proposed. For instance, adjectives typically lose their final consonant in masculine forms, but maintain it in feminine occurrences: *fort* [fɔʁχ] "strong masc." vs. *forte* [fɔʁχt] "strong fem." and the like are characteristic examples. Both were said to derive from the common and unique underlying root /fɔrt/. The masculine morpheme was zero, while the identity of the feminine suffix was schwa /-ə/. If the rule of consonant deletion applies before the one that evacuates final schwas, the correct surface forms are derived. The same kind of argumentation was made for the other morphemes that involve protective schwas. This discussion exceeds the scope of this paper. The relevant information is available in, among many others, Dell (1973: 177ff), Tranel (1981: 277ff).

Hence, half of the technology that is needed in order to run a syntagmatic implementation of (5) in the spirit of Lower was already solidly assessed in the analysis of French: word-final "protective yers" and the rules deleting them were needed anyway (though not in all instances of words that end in a consonant on the surface, that is true). Perhaps the ongoing debate on abstractness (e.g. Kiparsky 1968, 1982, Kenstowicz & Kisseberth 1977: 1-62, Hooper 1976) with firm advocates of "concreteness" (i.e. anti-abstractness) on the French side (Tranel 1981) was a ban on generalizing "abstract schwas" to all triggering contexts including the one after Codas. Or perhaps the label "protective" intuitively prohibits considering this object as a trigger of phonological processes ([+ATR] → [-ATR], schwa → [ɛ])?

Be that as it may, let us return to the discussion of Anderson's Coda-capture. Edicting that the disturbing open syllables are closed misses



another important insight that Lower expresses: it is not just any arbitrary kind of open syllable that behaves as if it were closed, but precisely the one whose righthand neighbour hosts a very peculiar vowel. What is so special about this vowel? Of course, Anderson and the other authors that have identified the relevance of the yer context (5) in French were aware of the list of special properties displayed by French schwa, including the fact that it alternates with zero. But they did not establish any kind of causal relation between this property and the fact that only this vowel has a special influence on the preceding syllable. If any other vowel, say non-alternating [u], had displayed this behaviour, the Coda-capture rule would simply have stated that Onsets of syllables whose Nucleus is /u/ are re-syllabified as the Coda of the preceding syllable if their Rhyme does not bear a Coda. In yet another scenario, the Coda-capture rule would have sounded exactly as was proposed by Anderson if French schwa did not alternate with zero.<sup>46</sup>

This is in fact another typical property of early generative analysis, consubstantial with the one that was depicted earlier: rules transform X into Y in the vicinity of the context A. We are not interested in the causal relation involved: why does A turn X into Y rather than into Z? Why is X

<sup>46</sup> Coda-capture is not the only possible attitude towards the problem, as is demonstrated by the wise position taken in Dell (1973: 211f, 214). The triple disjunction [1) before a word-final consonant, 2) before two consonants of falling sonority, 3) before a single consonant or two consonants of rising sonority if the following vowel is schwa] is listed without ambiguity. Dell does not doubt a moment that a sound phonological theory must allow for the reduction of this reality to a non-disjunctive statement. Since 3) cannot be expressed in terms of a closed syllable, Dell pinpoints this fact, expresses the desire to do away with it and leaves the question open for further investigation: "Nous renonçons pour l'instant à expliquer pourquoi E-AJ traite ə et e comme s'ils se trouvaient en syllabe fermée lorsqu'ils sont en syllabe ouverte et que la syllabe suivante contient un schwa" (214). He clearly chooses between deriving the correct surface forms via Coda capture *ex machina* and an explanatory analysis: as the latter was not available at the time he wrote, he preferred not to submit any solution, which I believe was the best solution.

turned into Y by A rather than by B? These questions had no answers, and they would not even be taken as relevant questions (Foley 1977: 4).<sup>47</sup>

By contrast, precisely this causality is the very essence of Lower: a yer is vocalized iff followed by another yer. There would be no way to replace the triggering yer by another vowel since only the fact that yers alternate with zero opened the opportunity to posit triggering yers that never reach the surface at the underlying level.

It is only when both the Slavic and the French pieces of the puzzle (19) are identified that the crucial question can be raised: what is the common feature of the triggering yers (appearing as [ɛ], [ɔ], [a] etc. in particular Slavic languages) and the French schwa? The answer is beyond any doubt: the fact that both alternate with zero. Hence, any analysis that does not encode this causality between the alternating character of the triggering vowel and its bearing on the preceding syllable must be erroneous. Anderson was wrong, Lightner and his followers were right.

But yet in one respect, the reverse is true: autosegmentalized versions of Lightner's Lower that were proposed by Rubach (1986), Kenstowicz & Rubach (1987) do not recognize empty Nuclei. One goal of the present paper is to achieve a synthesis of both insights: the Slavic syntagmatic solution (=yers) and the French way to get something for nothing (=empty Nuclei).

Given the yer analysis, what made the Slavic side refrain from acknowledging empty Nuclei in the French fashion, and for the same reasons? In order to understand the motivation for autosegmentalizing Lower in the way that was shown in section 2.6, we need to discuss the missing link in the evolution of the study of Slavic vowel-zero alternations: the paper that Spencer (1986) wrote on Polish.

<sup>47</sup> However, it must be said in defence of the "French" branch that the identification of the crucial property of schwa in regard of its relation to the preceding syllable, i.e. its alternating status, was not self-evident since the Slavic data and analyses were obviously set in no relation with the French data at all. This is probably due to the fact that there were no slavacists on the "French" side, and the literature dealing with Slavic data was not reviewed (at least it is completely absent from the texts dealing with the French alternations). One purpose of the present paper is to bridge this gap.

#### 5.4. Empty Nuclei prior to Government Phonology II: Andrew Spencer on Polish

Unlike Anderson (1982), Spencer (1986) did not have to struggle with the data and their analysis in terms of yers since he could build on Gussmann (1980) and Rubach (1984). He fully accepts the fundamental insights of Lower that have been discussed above: yers exist, and Polish does possess no Codas in alternating environments nor word-final consonants at the underlying level.

Spencer's purpose is not to construct a new analysis, but to make Lower and the formal apparatus used by Gussmann and Rubach less abstract. His motivation stems from the long lasting debate on abstractness that was initiated by Kiparsky (1968)<sup>48</sup>, and Spencer is firmly engaged against abstract analyses if a more concrete alternative is available. Thus, he does not intend to attack Lower in its essence, but merely aims at proposing a version of it that does not need to appeal to underlyingly present yers that are subject to absolute neutralization, the extensive use of extrinsic rule-ordering and the cyclic application of rules. In short, Spencer's goal is to achieve the same descriptive adequacy as Gussmann and Rubach while cutting down their formal machinery to a minimum and expanding the role of both the lexicon and allomorphy. He considers autosegmental representations as the adequate tool that allows to successfully implement this program.

One direct result of his approach is the equation "yer = empty Nucleus" (Spencer 1986: 255). Hence, the alternating pairs of the word for "day" [dʒɛɲ] *dzień* NOMsg – [dɲ-a] *dɔnia* GENsg and "dream" [sɛɲ] *sen* NOMsg – [sn-u] *sɔn-u* GENsg enjoy the following lexical representation.

The difference between both words is that the former, in addition to the vowel-zero alternation, shows a [dʒ]-[d] alternation, while the initial consonant of the latter is not affected. This contrast classically motivates

<sup>48</sup> This debate was led over the years by, among others, Stampe (1973), Schane (1974), Hooper (1976), Koutsoudas (1980), Dinnsen (1980), Tranel (1981), Kiparsky (1982).

(20)

dzień NOMsg	dnia GENsg	sen NOMsg	sɔn-u GENsg
C V C V	C V C V	C V C V	C V C V
dj n *	dj * n a	s n *	s * n u

the existence of two distinct yers, even though only one vowel alternates with zero: the front yer ɨ which has palatalizing effect and the back yer ɤ which does not induce palatalization. In the account of Gussmann (1980) and Rubach (1984), the underlying identity of the alternating vowel in *dzień* is a front yer, while the [ɛ] in *sen* originates as a back yer. Since Spencer wishes to do away with abstract vowels that are part of the phoneme inventory of the language, he equates the vowel yer with an empty Nucleus. Moreover, he conflates both yers into one single object: there is just one variety of empty Nuclei. As shown in (20), the palatality effects are achieved by the lexical presence of a /j/ in the root of *dzień* vs. its absence in the root of *sen* (on the fate of this /j/ see below).

On this account, the vocalization of the lexically present empty Nuclei proceeds as follows. Spencer (1986: 252) correctly translates the action of Lower into prose: "its effect is to lower all but the rightmost of a consecutive string of yers. The remaining yer is then deleted". His computation of empty Nuclei is a simple recast of this formulation: first, he gives a special status to the last member of a yer chain, calling it "extrametrical" (even though it may occur word-internally). In the representations in (20), these empty Nuclei are identified by an asterisk. Spencer further stipulates that extrametrical empty Nuclei may not receive melodic identification. All other empty Nuclei are then subject to epenthesis: [ɛ] is inserted. Finally, a late postcyclic rule deletes unassociated empty Nuclei. This rule feeds another rule that deletes the /j/ in cases where it occurs between two C-slots (like in GENsg *dnia*). If the /j/ is not deleted, it causes palatalization of the preceding consonant (like in NOMsg *dzień*).

Further implications of Spencer's account regarding the organization of the lexicon and the exact nature of allomorphy are not relevant for the purpose of the present discussion. In the next section, his contribution to

the analysis of vowel-zero alternations is evaluated in the light of the previous discussion.

### 5.5. Fill-in without causality vs. intervocalic relation

As was mentioned earlier, at no point of his endeavour, is Spencer concerned with the reduction of the nasty disjunctive yer context (5) to a non-disjunctive statement. He takes for granted that there are vocalic items present in the underlying representations in exactly the locations specified by Lower: word-finally, after Codas (triggering yers) and in alternation sites (alternating yers). He only "desegmentalizes" the objects in question, giving them a purely syllabic, non-melodic identity.

As far as I can see, a much simpler account is available under these provisions (and Spencer was in quest of concreteness  $\approx$  simplicity). Recall that the effect of Lower "is to lower all but the rightmost of a consecutive string of yers. The remaining yer is then deleted". A good question to be asked is why the "remaining yer", i.e. the last yer of a yer chain, should exist in the first place if it is deleted anyway and needs the very suspicious stipulation of (word-internal) "extrametricality". This leads us to the crucial shortcoming of Spencer's analysis: there is no reason for the existence of the extrametrical empty Nuclei in his account. And why would the insertion strategy he advocates produce identical results if the last yer of a yer chain were not embodied by an empty Nucleus? Because *there is no causal relation between the existence of an empty Nucleus (= a yer) and the vocalization of its preceding peer*. Spencer's rule that inserts melodic content to empty Nuclei makes no reference to the melodic status of the following syllable at all. It simply says "insert [ɛ] into empty Nuclei".<sup>49</sup>

<sup>49</sup> The absence of an intervocalic causal relation in his analysis exists even though Spencer (1986: 255) explicitly mentions that one of his motivations was an insight from the analysis of Finnish: "The C slot, though empty, can condition syllable-sensitive rules, but if left unassociated at the end of a derivation is deleted."

In this respect, Spencer and Anderson behave alike: both posit empty Nuclei, but neither incorporates the fundamental insight from Lower according to which the effects of (5) do not originate in the paradigmatic organization of syllable structure, but are caused by a syntagmatic relation between two vowels.

While Rubach (1986) and Kenstowicz & Rubach (1987) welcome the idea of eliminating the yers from the underlying inventory of vowels in giving them an autosegmental representation, they disagree on the consequences induced by Spencer's empty Nuclei. Namely, palatalization is regularly triggered by the adjective marker [-n-] in words such as *głos* [gwɔs] "voice" vs. *głoś-n-y* [gwɔɕ-n-i] "loud". On the other hand, we know that the adjective marker in question is yer-initial since a vowel occurs in predicative forms where the final -y is absent: pol. *win-ien* [vɨn-ɛn] - *win-ɔn-y* [vɨn-n-i] "guilty", cz. *nemoc-en* - *nemoc-ɔn-y* "ill". Hence, if the underlying identity of the adjectival [-n-] were an empty Nucleus followed by an [n] /-Vn-/, how should palatalization be achieved? Since the empty Nucleus is not subject to epenthesis, it will be deleted on Spencer's account. Consequently, no palatal agent is available that could trigger palatalization.<sup>50</sup> On the strength of this argument and a few others, Rubach (1986: 257f) concludes that 1) the autosegmental idea is good, 2) the elimination of the yers from the underlying inventory of vowels is called for, 3) yers must enjoy a melodic identity, and 4) representations must allow for the existence of two different yers, one palatalizing, the other not.

The consequences of this scenario have been exposed in section 2.6. There is no more melodic difference between stable /ɛ/ and the yers. The alternating properties of the latter are achieved by the fact that they are lexically unassociated to either a skeletal slot or a syllabic constituent.<sup>51</sup>

In the light of the evidence regarding the other Slavic alternations discussed under (15) (Czech VV-V, Polish "ą"- "ę", Polish and Czech [ɔ]-

<sup>50</sup> But see the solution proposed by Gussmann (1992) and Bethin (1992) in defence of Spencer that records palatalized consonants in the lexicon.

<sup>51</sup> See Piotrowski (1992a, b) and Piotrowski et al. (1992) for more discussion of Spencer's (1996) analysis and autosegmental solutions for the yer problem.

[u(u)], Spencer's analysis runs into even more serious trouble. Since there is no causal relation between the site where the segmental effect is observed and the following vowel, what could be the trigger of these alternations? The underlying identity of the target vowels in question is certainly not an empty Nucleus. The same holds true for French ATR-alternations. In sum, the discussion of (15) concluded that not only must there be an intervocalic relation, but that theory must also be able to distinguish triggering from alternating yers. Since on Spencer's account, vocalization is not triggered by any object but occurs by default, no such difference can be made, and the associated processes where vowels alternate with something different from zero remain unexplained.

Yet another fact constitutes a serious hurdle for Spencer's analysis: there are languages where more than one vowel alternates with zero. Among these are Eastern Slavic (typically [ɛ]-ø from Common Slavic soft yers vs. [ɔ]-ø from Common Slavic hard yers) and Slovak. Rubach (1993: 134ff) has collected a truly convincing set of arguments that eliminate any possibility of insertion.

Before we can proceed to a summary of the approaches outlined above, a brief discussion of Szpyra's (1992) analysis is in order. Participating in the drive against abstract underlying structures (see the discussion in section 5.3), she aims at doing away with yers that never appear on the surface (i.e. those with morphological value). This is achieved in denying the intervocalic causality of Polish vowel-zero alternations altogether: yers are present in underlying representations, but are not vocalized because of the presence of a yer in the following syllable. Rather, they come into phonetic being in order to salvage unsyllabifiable consonants that could not otherwise be accommodated. Her argumentation crucially hinges on the analysis of the alternations mentioned in (15)c,d: Polish "ę"- "ą" and "o"- "ó". For the sake of her demonstration, the yer context (5) controlling them must not be deprived of its disjunctivity (see also note 34). She thus explicitly welcomes the disjunctive statement "in closed syllables and before a yer". Besides the fact that disjunctions are suspicious per se, she ultimately draws a red line in the middle of three processes that are governed by identical contextual conditions: "ę"- "ą" and "o"- "ó" obey the disjunction, whereas vowel-zero alternations are due to a single cause, that is the unsyllabifiable character

of certain consonants. Moreover, if the non-Slavic data discussed should be accounted for along the lines of her analysis, the cross-linguistic generalizations they imply could not be formulated.

### 5.6. We are looking for a theory of intervocalic relations

Before examining the advent and use of empty Nuclei in Government Phonology, let us summarize the different views that were expressed in the preceding sections. Table (21) provides a synopsis (the term "abstract

(21)

	Slavic				French
	linear	non-linear			
	Gussmann (1980), Rubach (1984)	Spencer (1986)	Szpyra (1992)	Rubach (1986), Kenstowicz & Rubach (1987)	Anderson (1982)
presence of yers in the underlying vocalic inventory	yes	no	no	no	no
underlying melodic identity of vowels that alternate with zero	yes	no	no	yes	no
"abstract vowels" in word-final position and after Codas	yes	yes	no	yes	no
causal intervocalic relation	yes	no	no	yes	no
coda capture	no	no	no	no	yes
deletion of unassociated "abstract vowels"	yes	yes	—	yes	yes
"abstract vowels"/ vowels that alternate with zero = empty Nuclei	no	yes	no	no	yes
"abstract vowels" = floating matrices	no	no	no	yes	no
"abstract vowels" = floating root-nodes unspecified for any feature	no	no	yes	no	no

vowel" subsumes both yers in the traditional generative sense and empty Nuclei in Spencer's 1986 analysis).<sup>52</sup>

This comparison allows for two interesting observations. First, under no analysis do the empty Nuclei (Anderson, Spencer), floating matrices (Kenstowicz & Rubach) or yers (linear accounts) "survive" on the surface. This is understandable in the latter case where the presence of a feature matrix in the linear string is the only condition on its phonetic expression. But it does not follow from any principle in non-linear accounts: one cornerstone of autosegmental representations is the fact that a phonetic expression is the result of the association of a feature bundle with a skeletal slot (which is itself linked to a syllabic constituent). A feature matrix alone may be present, it will not appear on the surface if it is not associated to a syllabified skeletal slot. Conversely, a syllabic constituent (provided with a skeletal slot or not) will not be phonetically interpreted if it lacks melodic content. At least this is the situation of empty Onsets in vowel-initial words. Hence, there is no reason, a priori, to assume that empty Nuclei or floating feature matrices are deleted if they do not reach the surface. They may as well subsist.

Second, it is noteworthy that, among the authors who assume a causal relation between the triggering yer and the alternating vowel, this intervocalic relation remains nameless. The formulation never exceeds "a yer is vocalized if there is a yer in the following syllable". However, I have tried to show that the existence of this intervocalic relation is the backbone of Lower and sets accounts using this concept apart from others. Consequently, it may be surprising that the central device of the crucial instrument has attracted so little attention. What is the exact nature of this force that relates two vowels, is disbalanced (one is under the spell of the other) and strictly directional (always right-to-left)? Put in another way, why is it that the existence of yers always conditions the preceding vowel, but never the following syllable?

We have now completed the following steps: data whose distribution is governed by the yer context (5) have been collected in section two

<sup>52</sup> Szpyra (1995: 107ff) provides a more elaborate discussion of the various representations of yers that have been put forth.

(Slavic vowel-zero), three (other Slavic alternations) and four (French alternations). The analyses they have given way to have been exposed and evaluated in section 5. On the remaining pages, I will try to weave all these strings into one solid rope that can support the entire weight of the puzzle (19).

## 6. Government Phonology and yers

### 6.1. Abstract vowels are Empty Nuclei, Structure Preservation and Government

As was shown above, empty Nuclei existed before Government Phonology (GP) was constituted in print: the two major references are Kaye et al. (1985, 1990), and empty Nuclei appear only in the latter text. However, the empty Nucleus is a typical and genuine GP concept. For one thing, neither Anderson (1982) in the French nor Spencer (1986) in the Slavic tradition have found any followers who would have maintained and developed the theoretical potential of empty Nuclei. On the other hand, empty Nuclei are central in the conception of grammar that underlies GP. They have been introduced into the theory for reasons that are of purely theoretical, rather than empirical nature. From the beginning on, the research project of Government Phonology was to build a "syntax of phonology", using central concepts from syntactic theory. By this token, phonological versions of the Projection Principle and the Minimality Condition were proposed (Kaye et al. 1990: 221ff). But the syntactic import that had most far-reaching consequences was Structure Preservation: a constituent is not deleted when the material it was hosting is absent. The phonological version thereof precisely precludes the deletion of an Onset or a Nucleus in case the associated melody, for one reason or another, should be phonetically absent. Hence, all alternations of a segment with zero concern exclusively the melodic part of the autosegmental representation, while constituent structure remains untouched.

Another important consequence of Structure Preservation is that re-syllabification is prohibited (Kaye et al. 1990: 221ff): a melodic object

that is "born" in a Coda cannot surface in an Onset.<sup>53</sup> Given these premises, the question arose how many empty Nuclei a structure can support and what their phonological status is in case they lack any phonetic reflect. Again parallel to syntax, a phonological Empty Category Principle (ECP) was proposed for that sake. In its primitive version, it simply stated that an empty Nucleus may remain phonetically unexpressed if it is properly governed (Kaye et al. 1990: 219).<sup>54</sup> Sound governors are contentful Nuclei that possess a phonetic existence.

Hence, this way of restricting the existence of empty Nuclei has introduced a syntagmatic relation between two Nuclei that is disbalanced: one Nucleus acts as the governor, the other is the governee. This typical dependency relation has given its name to the theory: Government Phonology. And we have now found, I submit, the lateral relation we were looking for.

Before going into further detail, let us summarize to what extent GP reproduces concepts that pre-existed for different reasons, and to what respect it has developed tools that may turn out to cover empirical situations that were orphan before. Empty Nuclei are not an invention of GP, but GP is the only framework that has given them a theoretical status. In GP, there is no other way than considering vowel-zero alternations as the presence vs. absence of melodic material in a Nucleus. Hence, the identity of Slavic yers, French schwas and any other vowel that alternates with zero in any other language must be an empty Nucleus in case the zero-alternant appears. Abstract vowels = empty Nuclei. However, Structure Preservation forces GP to be significantly different from all approaches summarized under (21): only melody may or may not be absent from surface structure, the corresponding Nucleus is always present. Recall that both on Anderson's (1982) and Spencer's (1986) approaches, empty Nuclei that do not vocalize are deleted. Another point

<sup>53</sup> Typical scenarios of word-final resyllabifications when a vowel is suffixed to a /CVC/-root do not arise since the final C of the root is the Onset of an empty Nucleus (see below section 6.3.1).

<sup>54</sup> Or if they are domain-final; see Kaye (1990a). Later on, proposals were made to the effect that the ECP may be satisfied in other configurations as well, see Kaye (1992), Gussmann & Kaye (1993), Scheer (1996, 1999).

is that the relation between vowels that we have good reason to look for is not intervocalic but internuclear: GP offers a name and a theory for the causal relation between yers that constitutes the spine of Lower. And of course, government is a genuine device of GP.

But what about the objections made by Rubach (1986) and Kenstowicz & Rubach (1987) against the empty Nucleus-analysis? This problem will be addressed in the next section.

## 6.2. Again: deletion or insertion?

Originally, the government-analysis of vowel-zero alternations relied on insertion: alternation sites are underlying empty Nuclei which are filled in by default when they escape Proper Government (Kaye et al. 1990: 219ff, Kaye 1990a, Charette 1990, 1991). This surely is the null hypothesis that one is entitled to make in the absence of conflicting evidence (cf. Spencer 1986). The theoretical devices related to vowel-zero alternations were developed at that time mainly on the basis of Moroccan Arabic (Kaye 1990b), French (Charette 1990, 1991) and Tigrinya (Kaye et al. 1990: 222ff). In all of these languages, there is only one vowel that alternates with zero, a situation that the insertion analysis is able to cope with. None of the arguments put forth by Rubach (1986) and Kenstowicz & Rubach (1987) (cf. section 5.5) could be made on the evidence from these languages: not only they do not possess more than one alternating vowel, but the vowel that does alternate has no triggering or blocking effect on rules that apply to neighbouring segments.

Later on, it was proposed that alternating vowels must be underlyingly present. This move was taken in Scheer (1997: 80f, 1998b: 264f, 1999: 229f).<sup>55</sup> It was motivated by one of the arguments mentioned, that is,

<sup>55</sup> Yoshida (1993: 138) had already proposed that the melodic material of vowels that alternate with zero is lexically present. However, this was assumed only for languages where mid (=complex) vowels alternate, and their lexical representation (whether attached or not) was not discussed. Yoshida holds that schwas, high and low vowels that alternate with zero are instantiations of empty Nuclei that do not possess any melody in the lexicon.





and alternating yers that was discussed at length in sections 2.2, 2.4 and 3.3. Recall that triggering yers are those that never appear on the surface, while alternating yers are vocalized when they are followed by another yer. It was shown that yer internal (section 2.2) and diachronic (section 2.4) reasons, as well as alternations involving other alternants (section 3.3) require that this difference be made by any theory. It now appears that precisely this contrast is not only derived from, but in fact enforced by CVCV. I take this to be significant support for CVCV.

In the next section, the status of the last vowel/Nucleus that appears in the representations in (22) is examined.

### 6.3. Extra empty Nuclei

#### 6.3.1. Final empty Nuclei

Lower presupposes the existence of word-final abstract vowels for all words that end phonetically in a consonant. This is a genuine Government Phonology-claim. As in the case of empty Nuclei, the original idea was developed for the purpose of Slavic data regarding vowel-zero alternations. The final yers were given morphological value (just as the “protective” schwas in French), and nobody sought to extend their existence beyond Slavic (or French). The step taken by Government Phonology was to make this language-specific analysis a universal claim. And as before, this was done on the grounds of entirely independent empirical evidence, with no reference to the Slavic situation.

Kaye (1990a) has examined the so-called Closed Syllable Shortening: a long vowel shortens if a Coda consonant is present in its Rhyme. In Yawelmani, CVVCvC-CV [ʔaamil-ka] sequences alternate with CVCØC-VC [ʔaml-al]. If it is true that vowel-zero alternations imply the existence of a non-deleted empty Nucleus even when zero surfaces, the vowel shortening may not be ascribed to the presence of a Coda in the Rhyme since the consonant following the shortened vowel is the Onset of an empty Nucleus. Moreover, Kaye (1990a) observes that the two consonants that flank the empty Nucleus, and that allegedly constitute a Coda-Onset sequence obey no distributional restrictions. This is unexpected since Coda-Onset interludes usually exhibit a falling sonority

profile. He concludes that “Closed Syllable Shortening” has got nothing to do with closed syllables. Rather, long vowels are shortened iff the following Nucleus is empty. Or, translated into Slavic terms, when the following syllable bears a yer: recall the Czech alternations from section 3.1 *žáb-a* vs. *žab-Øk-a*, *žab-ek*, *žab-Ø* “frog NOMsg, dim NOMsg, dim GENpl, GENpl”. When Kaye developed his analysis, he probably ignored that his result “long vowels shorten before a vowel that alternates with zero” was correct also for Slavic data. The only difference between the phenomenon analyzed by Kaye and the Czech alternations in vowel length is the phonetic status of the triggering Nuclei. These host vowel-zero alternations in both instances, but in the former case, they preclude a long vowel in the preceding syllable only if they are phonetically unexpressed. In the Czech examples on the other hand, they prohibit vowel length in the preceding syllable in any event, whether phonetically present (*žab-ek*) or not (*žab-Øk-a*). This is precisely the reason why the Yawelmani (and Turkish, cf. below) facts are not illustrative of the yer context (5).

Kaye (1990a) had to conclude on the existence of word-final empty Nuclei in vowel-shortening languages since shortening also occurs before a word-final consonant: [pana-t] vs. [panaa-hin] in Yawelmani, [merak] vs. [meraak-i] “law NOM, possessive” in Turkish. If shortening is triggered by the existence of a following empty Nucleus, the final consonant of a word where shortening obtains must sit in the Onset of an empty Nucleus as well. On the other hand, in languages where “Closed Syllable Shortening” is observed only word-internally, but not word-finally such as English (*keep*, *leave* vs. *kept*, *left*), Kaye (1990a) maintains a true Closed Syllable analysis: the vowel in *kept* is short because the [p] is the Coda of its Rhyme.<sup>59</sup> Hence, if long vowels are banned from closed syllables in English, the final consonant of *keep*, *leave* cannot close the syllable that contains the long vowel. The only solution is to make it the Onset of an empty Nucleus: /kii.pØ, lii.vØ/. As a consequence, word-final consonants in all languages (whether of the Yawelmani or the English type) are the Onset of an empty Nucleus.

<sup>59</sup> Hence, assuming Structure Preservation, *keep* and *kept* must be two separate lexical entries. For implications thereof, see Kaye (1990a: 323ff).



This way, a cross-linguistic claim was made that was identical to the language-specific analysis of Slavic. The latter was made earlier than the former, but did not inspire it. Two very different traditions reached the same result, but did not really recognize this fact.

### 6.3.2. Empty Nuclei after internal Codas

Government Phonology as it stood in the early 90s had the following means to identify empty Nuclei: 1) consonant-final words end in an empty Nucleus, 2) vowels that alternate with zero are hosted by an underlyingly empty Nucleus, 3) so-called bogus clusters enclose an empty Nucleus: English [tl]-clusters such as in *atlas*, *antler* cannot be branching Onsets (they do not occur word-initially), and do not qualify as Coda-Onset sequences either because their sonority (GP terminology: Charm) profile is opposite to what it should be. Both consonants are Onsets that enclose an empty Nucleus.<sup>60</sup>

In all other configurations, consonants were reputed not to be separated by empty Nuclei. How does this prediction relate to the Slavic facts? Does it embrace them as it did with regard to final empty Nuclei? The answer is twofold: yes as far as vowel-zero alternations and the French schwa-[ε] are concerned, but no when alternations in vowel length, Polish “a”-“ę”, Czech-Polish [ɔ]-[u(u)] and French ATR-values are concerned.

In the former situation, closed syllables are always produced by vowel-zero alternations. In any instance of [C<sub>1</sub>vC<sub>2</sub>-CV] pol. *pies-ka* “dog dim GENsg” where “v” alternates with zero, its phonetic manifestation is due to a closed syllable which is closed on the surface, but for which it is assured that in fact C<sub>2</sub> is the Onset of an empty Nucleus (or of a yer, whatever is your favourite formulation). If the final vowel is removed, this empty Nucleus surfaces: [C<sub>1</sub>vC<sub>2</sub>-vC] pol. *piesek* “dog dim NOMsg”. In other words, all instances where the alternating object (in this case a vowel alternating with zero) is conditioned by a phonetically closed syllable, it can be shown that the consonant that allegedly closes the

<sup>60</sup> See Harris (1994: 67f, 182ff) for a more elaborate characterization of the notion of bogus clusters.

syllable in fact is the Onset of an empty Nucleus, which acquires phonetic expression in the appropriate context.

The case of French schwa-[ε] is similar: schwa does not occur in closed syllables at all, neither internal, nor final. The only way to tell a stable [ε] such as in *j'enchaîne* [ãɲʃɛɲ] “I chain” that does not alternate with schwa (compare with *enchaîner* [ãɲʃɛne] “to chain”) from an alternating one (*j'ensorcèle* [ãnsɔʁsɛl] “I bewitch” vs. *ensorceler* [ãnsɔʁsɛle] “to bewitch”) is to observe its behaviour in a \_\_CV context. If morphology does not permit to carry out this test as, for example, in all CC-final roots such as *Valert* (*j'alerte* [alɛʁt] “I alert” = *alerter* [alɛʁte] “to alert”), there is no reason to assume that we are facing an [ε] that alternates with schwa. Hence, no empty Nucleus needs to be assumed between the [χ] and the [t] of the verb *alerter*, while there must be an empty Nucleus between the [l] and the [m] of *ensorcèlement* [ãnsɔʁsɛlɛmɛ̃] “the fact of bewitching”. This prediction is indeed borne out since schwa-zero alternations are optional in French, and a schwa surfaces in the alternative pronunciation *ensorcèlement* [ãnsɔʁsɛləmɛ̃]. As a consequence, no empty Nucleus must be assumed that is not independently motivated by a vowel-zero alternation.

This does not hold true when we turn to the Czech alternations in vowel length. In a word like *žab-ka* “frog dim NOMsg”, the short vowel is due to a following empty Nucleus/yer, and this fact is demonstrated by the appearance of an [ε] in the genitive plural of the same word: *žab-ek*. But there are also cases where no vowel appears between two word-final consonants: *pravd-a*, *korb-a*, *kajd-a*, *křivd-a*, *harf-a*, *miliard-a*, *valch-a*, *jirch-a*, *sekt-a*, *blept-a*, *revolt-a*, *hejn-o*, *lejn-o*, *salt-o* “NOMsg truth, tipper lorry, jacket, pain, harp, multimillionaire, washboard, white leather, sect, gossip, revolt, swarm, excrement, salto” have genitive plural forms where no [ε] appears: *pravd*, *torb*, *korb*, *kajd*, *křivd*, *harf*, *miliard*, *valch*, *jirch*, *sekt*, *blept*, *revolt*, *hejn*, *lejn*, *salt*.<sup>61</sup> The shortness of the vowel

<sup>61</sup> Note that these words belong to the same paradigm as the words that do show length-alternations *žáb-a* vs. *žab*, i.e. feminines in -a and neuters in -o. The examples concern both native (e.g. *pravda*) and loan (e.g. *miliarda*) vocabulary. The examples are chosen among words with identical morphological pattern, the last two consonants being monomorphemic.

preceding the stem-final consonant cluster in nominative forms where a suffixal vowel is present cannot be attributed to any empty Nucleus that would betray its existence through a vowel-zero alternation in this case. Given that there are words that do liberate a yer in the same morphological situation: the genitive plural of NOMsg *farm-a*, *Vilm-a*, *palm-a*, *norm-a*, *reform-a*, *kaps-a*, *zebr-a*, *algebr-a*, *kobr-a*, *sestr-a*, *kmotr-a*, *bucht-a*, *jacht-a*, *placht-a*, *kart-a*, *žebr-o*, *patr-o*, *vnitr-o*, *jitr-o*, *metr-o* “farm, Wilma (female first name), palm, norm, reform, pocket, zebra, algebra, cobra, sister, godmother, kind of dumpling, yacht, sail, card, rib, floor, inside, morning, metro” are *farem*, *Vilem*, *palem*, *norem*, *reforem*, *kapes*, *zeber*, *algeber*, *kober*, *sester*, *kmoter*, *buchet*, *jachet*, *plachet*, *karet*, *žeber*, *pater*, *vniter*, *jiter*, *meter*.

The conclusion enforced by this evidence is that not just phonetic Coda-Onset sequences that are broken up by an alternating vowel are separated by an empty Nucleus. Rather, there are no Coda-Onset sequences at all, there are no Codas at all, there are no closed syllables at all: surface Coda-Onset sequences that are broken up by an alternating vowel are separated by an alternating yer (*jacht-a* – *jachet*); those which never flank a vowel on the surface are separated by a triggering yer (*pravd-a* – *pravd*).<sup>62</sup> In other words, both consonants of both kinds of clusters sit in Onsets. The former is separated by a Nucleus that is lexically provided with melodic content as under (22)c, while the latter also flanks a Nucleus, but which lacks any lexical melodic identity, cf. (22)a. Consequently, there are no Codas nor closed syllables left. The only instance in the entire grammar that resists CVCV are branching Onsets.

The same argument holds true for French ATR-alternations. These are valid for the entire language, there is no such thing as two different kinds of mid vowels, one alternating in ATR, the other not: all French mid vowels are subject to ATR-variation. Hence, the non-ATRness of the mid vowel in a word like *il appellerà* [apɛlɛʁa] “he will call” can be motivated by the appearance of a schwa in the alternative pronunciation [apɛlɔʁa]

<sup>62</sup> Of course, as was demonstrated earlier, both alternating and triggering yers trigger the effects observed in the preceding syllable, while the reverse is not true: only alternating, but not triggering yers alternate with zero.

(recall that schwa-zero alternations are optional in French). But no overt schwa will ever motivate the non-ATRness of *alerter* [alɛχte] “to alert”: \*[alerɔte]. Hence, if it is true that mid vowels are non-ATR if followed by a yer, there must be a yer between [χ] and [t] as well. Accordingly, there are no closed syllables at all, there are only two kinds of “empty Nuclei”: those provided with a lexical melody as in *il appellerà* [apɛlɛʁa] = /apɛlɔʁa/ “he will call”, and those that lack this melody such as in *alerter* [alɛχte] = /alɛχ\_te/ “to alert”.

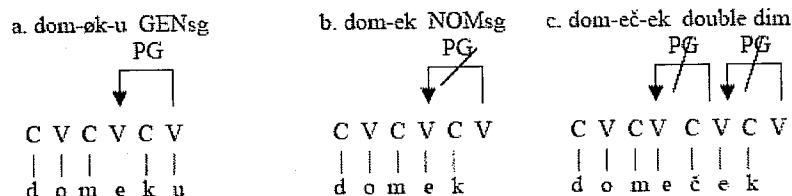
We have now reached the important conclusion that the yer context hints at an underlying CVCV interpretation not only for Slavic, but also for French. The only area that remains non-CVCV regards branching Onsets. This issue will not be taken up in this paper.<sup>63</sup>

#### 6.4. Proper Government derives Havlík’s Law, not Lower

The relevant tools for the analysis of vowel-zero alternations in a CVCV frame have been introduced in the previous sections: 1) vowel-zero alternations are not due to an intervocalic, but to an internuclear relation; 2) the relation in question is of Dependency type, that is disbalanced: one member is the head, the other the dependent. The former has precedence over the latter; 3) this Dependency relation is called Proper Government (PG); 4) governors must be contentful (=phonetically expressed); 5) governees remain phonetically unexpressed; 6) a Nucleus cannot be governor and governee at the same time: a governed Nucleus is unable to dispense PG; 7) PG is right-headed; 8) PG targets Nuclei that are lexically unassociated to melody; 9) there are two kinds of such Nuclei: those that lack any melody (=triggering yers) and those that possess floating underlying melody (=alternating yers). The diagram in (23) shows how the basic Slavic pattern is analyzed under these provisions.

<sup>63</sup> The representation of branching Onsets in CVCV is discussed at length in Scheer (1996, 1997, 1998b, 1999, 2000).

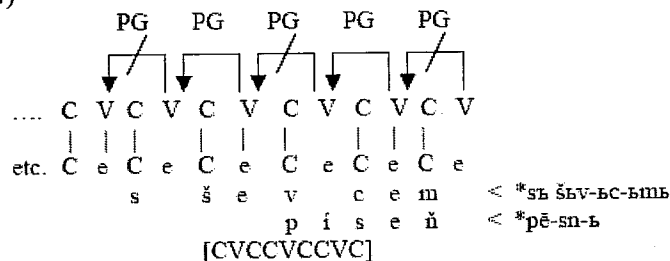
## (23) Czech "little house"



In (23)a, the stem-final Nucleus which hosts the suffixal vowel properly governs the preceding Nucleus. In (23)b, however, it cannot dispense PG since it lacks melody. In (23)c, the second but last Nucleus is therefore expressed. Consequently, the Nucleus flanked by [m] and [č] should be under PG, i.e. phonetically absent. However, this is not the case.

It appears that Proper Government does not derive the modern Slavic state of affairs described by Lower. Instead, it produces the alternating system discovered by Havlík: in a chain of several Nuclei with floating melody, every second item, counted from the right edge of the chain, receives phonetic expression.<sup>64</sup> This situation is depicted in (24).

## (24)



<sup>64</sup> Recall the special status of final empty Nuclei in regard of the ECP: Nuclei remain phonetically unexpressed if they are subject to PG or if they are domain-final.

Note that not all vowel-zero alternations found in modern languages follow the pattern found in modern Slavic languages: Moroccan Arabic (Kaye 1990b), German (e.g. Noske 1993, Wiese 1996) and French for example are faithful instantiations of Havlík's Law. In a French schwa-chain such as *je ne te le redemanderai pas* "I will not ask you that again" for example where all spelled "e"s are schwas, any number and combination of schwas may be dropped provided that no two adjacent schwas drown. In a formulation that has become famous, this regularity is stated in terms of consonants: "any schwa may be dropped provided the result thereof is not a sequence of three consonants", known as Grammont's (1914) "loi des trois consonnes".<sup>65</sup>

Of course, the goal of any theory must be to cover both situations: Havlík's Law and Lower. A proposal that views both empirical situations as non-related phenomena can hardly be granted any credit. Therefore, a parameter must allow to describe both variants of vowel-zero alternations with one single theoretical device.<sup>66</sup> We know from section 2.3

<sup>65</sup> See Dell (1973: 248ff) for discussion and precise formulation.

<sup>66</sup> I cannot see how this could be achieved without diacritic expense in the approaches of Anderson (1982), Spencer (1986), Rubach (1986)/Kenstowicz & Rubach (1987) and Szpyra (1992, 1995).

On the approach of Gussmann & Kaye (1993: 435), whether vowel-zero alternations in a particular language are regulated by Havlík's Law or Lower is decided by the kind of vowel that alternates with zero: if the vowel concerned is [i] (which is supposed to be the blank phonetic expression of empty Nuclei without any epenthetic activity), Havlík's pattern is observed, while Lower is in place in languages where any vowel different from [i] alternates with zero. This generalization is contrary to fact: in many languages such as French and German, [ə] alternates with zero, but the phonotactic pattern observed is Havlík's. The same holds true for Havlík-governed Old Czech, where [e] alternated with zero.

The account of yer chains such as in *pieseczek* "dog (double dim)" advocated in Gussmann & Kaye (1993) is peculiar insofar as it denies the causal relation between the vocalization of a yer and the presence of another yer in the following syllable. In the view expressed in this paper, the second and third yers of *pieseczek* are not audible because of any influence of the following syllable, but because

what makes the difference between Havlík's Law and Lower: on top of the vocalizations operated by the former, the latter gives phonetic content to those yers that are followed by another yer. The reader may verify that this difference is recast into Government-terminology in the way shown under (25).

they are domain final: [[[piesø]czø]kø]. Proper Government is said to apply cyclically, and a result achieved in a former cycle cannot be undone in a subsequent cycle. Hence, the diminutive suffix *-ek* is analytic (=coming with a phonological domain of its own), while case-markers such as the genitive *-a* are non-analytic (=sneaking into the domain of the root): pøš-a = [pøš-a], not \*[[pøš]a]. This analysis, which denies the causal relation expressed by the yer context under (5), is exposed to the following objections. For one thing, it must predict that all suffixes beginning with a yer are analytic, whereas all suffixes beginning with a vowel that is not a yer are non-analytic. In other words, the distributional fact that vocalization does not occur before any vowel, but only before yers, is purely accidental. It does appear at no point in the mechanism that Gussmann & Kaye (1993) put forth. The attempt to recast a phonological regularity in morphological terms (analytic vs. non-analytic) is also suspicious on the morphological side: while we control independently which vowel is a yer and which vowel is not (through alternation), there is no independent evidence that would help us decide which suffix is analytic and which one is non-analytic. At least Gussmann & Kaye (1993) do not present any such evidence, the analytic or nonanalytic status of each suffix considered (also of *-stw-* in *państewko* "state (dim)") remaining pure stipulation. In later work, Kaye (1995) uses evidence from stress as a major criterion in order to decide whether an affix is analytic or non-analytic (e.g. English [párent] and [parént-al] bear regular penultimate stress and thus constitute one single phonological domain, whereas [[párent]hood] betrays the analytic status of *-hood*, which is invisible to stress assignment). Polish is characterized by permanent penultimate stress, whatever suffixation or derivation is involved: *malin-a*, *málin-ø*, *malin-ámi* "raspberry NOMsg, GENpl, INSTpl", *piés*, *piés-ek*, *pies-écz-ek*, *pies-écz-k-a* "dog NOMsg, dim NOMsg, double dim NOMsg, double dim GENsg". If stress is relevant for the detection of morphological domains, this points to a non-analytic status of all suffixes in this language, against the contrast Gussmann & Kaye (1993) need for their analysis of analytic *-ek* vs. non-analytic *-stw-* and case markers.

- (25) Havlík's Law vs. Lower
- a. Havlík's Law: Proper Government applies without condition
  - b. Lower: Proper Government applies  
Nuclei that host alternation-sites may not act as governors

The restriction on governing abilities that produces more vowels when Lower applies instead of Havlík's Law may be formulated in another way as well: even when associated to Nuclei, lexically floating melodies may not govern. Or, yet more general: schwas may not govern. This statement requires a proper definition of "schwa". The sense given to schwa here is phonological: all and only the vowels that alternate with zero are called schwa. But there is also a phonetic reality to the label "schwa": in many languages where vowel-zero alternations are observed (French, German, modern Arabic languages), the alternating vowel is phonetically central and thus overtly deserves the name "schwa". In other languages where alternating vowels are not central but peripheral, their central identity is a diachronic fact. Slavic is a case in point. Furthermore, a causal relation between the central properties of vowels and their alternating character must exist anyway: diachronically, vowels start to alternate precisely when they are "weakened", that is, centralized. This is true for all languages I am aware of where diachronic information is available: German, Slavic, French (Arabic). Hence, the statement "schwa may not govern" has a phonetic, phonological, synchronic and diachronic motivation. Alternating vowels that are not phonetically central are simply schwas in disguise.

### 6.5. Arbitrary effects of the yer context?

Let us now come back to the problem that was raised in section 5.1 but could not be addressed then. The yer context (5) that controls the Slavic and French alternations summarized under (19) seems to provoke opposite and conflicting effects: a yer prohibits the existence of long (Czech) and tensed mid vowels (French) in the preceding syllable (a real vowel is required for long and tensed mid vowels to surface), while it enables vowels (Slavic) and [ɛ] (French) to appear (against zero and

schwa). This is a highly puzzling behaviour indeed: why should the same context sometimes provoke the strong alternant to appear, while favouring the weak one at other times?

There is only one solution to this puzzle: since all pieces are identical (syllabic situation, trigger), the difference must be found in the nature of the internuclear relation at stake. In section 5.6, we concluded on the need for a theory of intervocalic relations. We now see that the plural was in order: we are not dealing with one single internuclear relation known as Proper Government, but with yet another one, to be identified. The effect of Proper Government is obvious: its targets are silenced. Hence, it is certainly correct to say that Proper Government inhibits the segmental expression of its target.

The other lateral force we are looking for is phonological Licensing, which qualifies since it yields the opposite effect. Licensing is a process whereby a constituent or a segment (possibly via its constituent) receives support from another segment. The phonetic interpretation of segments or constituents that fail to be licensed is narrowed or null. This notion is part of common phonological background. It is exploited in, among others, McCarthy (1979), Goldsmith (1990), Itô & Mester (1993). In Government Phonology, Charette (1991) and Harris (1997) have put forth proposals that crucially rely on Licensing. The precise effects that both lateral forces Government and Licensing produce on consonants and vowels have been established in Ségéral & Scheer (2001): Government is destructive, Licensing helps. Government inhibits the segmental expression of its target, while Licensing backs up its melodic health.<sup>67</sup>

<sup>67</sup> In Kaye (1990a), the distributional generalization "long vowels shorten before empty Nuclei" is simply formulated without questioning the kind of relation contracted by both Nuclei. The existence of such a relation is supposed by Larsen (1998) in his analysis of Italian Tonic Lengthening and Lowenstamm (1996). Since the theory did not recognize internuclear Licensing at the time they wrote, both authors had to conclude that Government relates the long vowel and its righthand neighbour, although this lateral force was supposed to render its targets improper for melodic identification. However, vowel length is not precluded under Government on this analysis, but on the contrary Government would

Again, it appears that the theoretical tools that have been developed for entirely independent reasons match the empirical situation: the puzzle in (19) has no solution if a single internuclear relation is assumed. The identity of the arrow that stands for the internuclear relation may now be calculated according to the effects observed. Recall that Lower presupposes that yers (schwa) are unable to dispense Government. Accordingly, Slavic vowel-zero alternations and French schwa-[ɛ] are consequences of Government. More specifically, zero (Slavic) and schwa (French) occur under Government, while a vowel (Slavic) and [ɛ] surface when Government fails to apply.

On the other hand, long vowels (Czech) and tensed mid vowels occur if their Nuclei are targeted by Licensing. When Licensing is unable to reach its target, short (Czech) and lax mid vowels (French) are encountered.<sup>68</sup>

Both situations are sketched in (26) below.

In representations using CVCV, long vowels are two independent Nuclei that enclose an empty Onset, to which a single chunk of melody is attached. As any other branching structure, long vowels are headed. In the case shown under (26), long vowels are lexically left-headed and spread onto their complement if and only if this complement is licensed. In the two latter instances of (26), Licensing does not apply to the potential complement since the licenser either lacks phonetic content or is filled with a yer (schwa).<sup>69</sup>

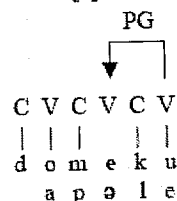
be a condition on its existence. This mismatch between a single cause (Government) and two opposite effects (inhibition vs. support of melodic expression) could not be resolved unless two different lateral agents were assumed. The correct move was taken by Yoshida (1993) who had extended Charette's (1990) notion of Government-Licensing to internuclear instances in the analysis of similar data from Palestinian Arabic. See Rowicka (1999: 59ff) on that issue.

<sup>68</sup> Rizzolo (forth) shows that the French ATR-alternation of mid vowels is in fact an alternation in vowel length. The table below follows this analysis.

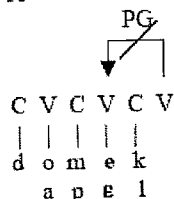
<sup>69</sup> Right-headed long vowels also exist. These are the ones that are entirely insensitive to their righthand environment. Long vowels in German, Czech and Somali for example are of that kind. Head-final long vowels may be long

(26)

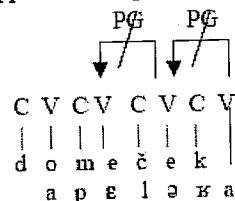
a. instances of Government  
 Slavic V-Ø: dom-Øk-u GENsg  
 French [e]-schwa: appeler inf.



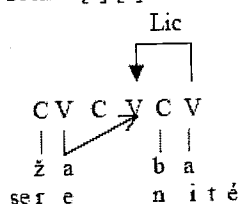
dom-ek NOMsg  
 appelle 3rd sg pres



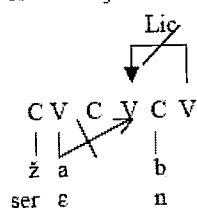
dom-eč-ek adjective  
 appellera 3rd sg future



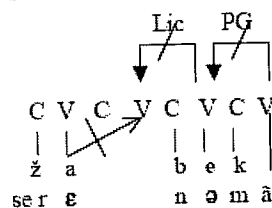
b. instances of Licensing  
 Slavic V-VV: žáb-a NOMsg  
 French [e]-[ɛ]: sérénité noun



žab GENpl  
 serene adj. fem



žabek dim GENpl  
 sereinement adverb



It comes as no surprise that Licensing is subject to the same existential parameters as its cognate Government: only Nuclei that enjoy a phonetic expression are sound licensors. Hence, Nuclei that are not lexically provided with melody may not dispense Licensing, and neither may Nuclei that are phonetically unexpressed because they are subject to Proper Government. In addition, in the Czech and French case at hand, yers (schwas) are not granted the power to act as licensors, just as they cannot govern in Slavic.

regardless to what happens in their environment because the complement they spread on is always licensed by the head: Licensing (as Government) is right-to-left. Accordingly, the head will always act as the licensor of its own complement. See Scheer (1998b, 2000) for discussion. The distinction head-initial vs. head-final long vowels is the principled recast of what is usually referred to as “languages admitting vs. prohibiting super-heavy Rhymes”.

An interesting complication arises when Slavic and French are compared: in the former case, yers can neither govern nor license. In French on the other hand (and at the stage of Slavic when Havlík’s Law was operative), schwa is able to govern, but cannot act as a licensor. The following table summarizes this situation.

(27) lateral actorship of yers (schwa)

	yers (schwa) may	
	govern	license
modern Slavic	no	no
French and Havlík	yes	no

It remains to be seen whether the propensity for lateral actorship of yers may be distributed in other ways.<sup>70</sup>

### 7. Conclusion

In this paper, I have pursued a diachronic and a synchronic goal. The former concerns the history of the analysis of vowel-zero alternations in the past 40 years. Three traditions are examined: one which is developed on Slavic grounds (Gussmann 1980, Rubach 1984, 1986, Kenstowicz & Rubach 1987, Spencer 1986, Szpyra 1992), another that builds on the empirical record of French (Dell 1973, Anderson 1982), and a third one which does not stem from the analysis of a particular set of data but rather from a theoretical endeavour (Government Phonology, Kaye et al. 1990, Charette 1991, Harris 1994, etc.). These traditions have worked on the same phonological event, that is, vowel-zero alternations in general and the puzzling yer context (5) in particular, but did not really reflect each other’s analyses and proposals.

<sup>70</sup> See Scheer (1998b: 281f, 2000: 192ff) for discussion of the combination of both lateral forces.

My goal was to show the precise content and motivation of each analysis, to confront them and do something that was not undertaken so far. That meant, bringing together all alternations that obey the yer context (5) and running the different analyses against this cross-linguistic record: if the highly specific character of the conditioning context excludes multiple and accidentally converging causalities, certain elements of the competing analyses must be abandoned, and others promoted to the status of candidates for a more general theory of vowel-zero alternations. For instance, only the confrontation of Slavic and French data allows for the correct formulation of the relevant context: the crucial property of the vowel in the following syllable that behaves as if it were not there is not to be a yer, a schwa or the manifestation of an empty Nucleus, but to alternate with zero.

More specifically, there are two logically possible moves when faced with the disjunction "in closed syllables and in open syllables if the following vowel alternates with zero": either the latter part "in open syllables if the following vowel alternates with zero" is an optical illusion and must be reduced to the former, or the closed syllable is a mirage and must be expressed in terms of open syllables. The former way was taken by Anderson (1982) who captures the underlying Onset of the following schwa into the preceding syllable. The Coda being captured, he can apply the necessary rules to closed syllables only. By contrast, the Slavic tradition produced Lower, which proposes the elimination of underlying closed syllables: the open-syllable context is generalized.

I have tried to show that the West was wrong, one more time.<sup>71</sup> Coda-capture is an artefact that is unwarranted for independent reasons (Harris 1999) and does not encode the crucial syntagmatic causality that is expressed by Lower, cf. section 5.3. On the other hand, the West was on the right track when proposing that the triggering yers/schwas sit in an empty Nucleus. This analysis is paralleled by part of the East, i.e. Spencer (1986), but could not be successfully implemented at that time for the

<sup>71</sup> See the paper by Gussmann & Harris (1998) entitled "Why the West was wrong", which traces down the history of the syllabic analysis of word-final consonants.

reasons exposed in Rubach (1986), Kenstowicz & Rubach (1987). I argue that this obstacle can be overcome when the theoretical tools developed in Government Phonology are taken advantage of. The (revised) theory of syntagmatic relations among Nuclei embodied as Government and Licensing offers a natural harbour for the expression of the intervocalic relation that constitutes the backbone of Lower, but whose precise characterization has been neglected on the Eastern side.

In the end, when the best of the three worlds is combined, CVCV emerges: there are no codas or closed syllables in either Slavic or French. A uniform analysis of all relevant alternations may not be achieved unless this most simple of all constituencies is assumed. Under these provisions, only one area of the grammar remains non-CVCV, that is branching Onsets. These are discussed in other places, cf. note 63.

The story of vowel-zero alternations also provides exemplary testimony of the research program underlying CVCV: phonological phenomena whose explanation is commonly sought in the existence of contrasting paradigmatic structures (syllabification) may turn out to be controlled by syntagmatic relationships among constituents whose structure does not vary. Outside Government Phonology as well, the evolution of syllabic theory since its (re)introduction by Kahn (1976) has led to significant impoverishment of syllabic arborescence: for many phonologists (but not all), onsets do not branch five times anymore, codas do not branch anymore at all, and restrictions rely on the maximal size of Rhymes. With respect to this issue, Government Phonology has always been avant-garde: a landmark on this track was the Binary Theorem (all constituents are maximally binary, Kaye 1990a: 306). CVCV is but the ultimate stage of this evolution.

Hence, the review of the history of vowel-zero alternations, the confrontation of two well-known empirical records and Government Phonology produces a synchronically relevant result, i.e. an argument in favour of CVCV. The present paper may thus be seen as a contribution to what Encrevé (1997) and Durand & Laks (1996) call the cumulative character of scientific investigation: bringing together different traditions and argue on the grounds of the entire pool of ideas and facts. In this sense, it appears that Lightner, Gussmann, Rubach, Anderson, Spencer and their

followers have practised CVCV in heavily clustering languages such as Slavic and French before a theory of this kind of constituency was available. CVCV, Government and Licensing offer a natural superstructure for these analyses.

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