Why the Prosodic Hierarchy is a diacritic and why the Interface must be Direct

1. Introduction

Since the 80s, the processing of non-phonological information in phonology has been dominated by two interface theories, Lexical Phonology and Prosodic Phonology. While the former is closely associated with stratal effects that rely on the existence of different classes of affixes, the latter translates phonologically relevant morpho-syntactic structure into a phonological arborescence that is known as the Prosodic Hierarchy.[1] The Prosodic Hierarchy to date stands unchallenged and is the theory-resident default when phonologists make reference to extra-phonological information. This has not changed in constraint-based environments which have taken over prosodic constituency with minor adaptations (e.g. Selkirk 2000, Kiparsky 2000, Bermúdez-Otero forth).

On the following pages, I show that the Prosodic Hierarchy is as much a diacritic as classical SPE-type boundaries (#, +), if an autosegmental one. Everybody today agrees that diacritics are non-linguistic objects and hence cannot be part of linguistic theory. This line of argumentation has contributed to outlaw # and the like; I argue that the Prosodic Hierarchy must be abandoned for the same reason.

A crucial advance made by Prosodic Phonology is the principle known as Indirect Reference according to which phonology cannot directly access morpho-syntactic structure and hence may not mention morpho-syntactic categories in the structural description of rules (or in constraints). The critical argument for Indirect Reference which is repeated over and over again in the literature is so-called non-isomorphism: the domain of the string which is phonologically relevant does not necessarily coincide with any morpho-syntactic constituent. Therefore, Prosodic Phonology argues, there must be a translating process whereby a Translator's Office – which is neither part of morpho-syntax nor of phonology – maps morpho-syntactic structure onto prosodic structure. While the Translator's Office takes morpho-syntactic structure as an input, it modifies it according to its own standards – thereby making it non-isomorphic – before handing it over to phonology in the coat of the Prosodic Hierarchy.

I argue that Prosodic Phonology has reached exactly the right conclusion – but for the wrong reason: non-isomorphism is a mirage that is created by analysis, not by linguistic fact; it appears when one looks at the data through a prism that imposes domains, rather than boundaries. Non-isomorphism evaporates as soon as the same data are interpreted in terms of the latter. On the other hand, a good reason for the existence of the Translator's Office is modularity: different modules do not speak the same language (of the brain, e.g. Jackendoff 1992 et passim), and hence can only communicate through a no-man's land-based translation.

If the Prosodic Hierarchy thus is a domain-created mirage and boundaries turn out to be the correct interface currency, we seem to be requesting a self-contradicting theory, i.e. one where extra-phonological information is represented as *non-diacritic boundaries*. I show that this term does not need to be self-contradictory: its paradoxical flavour stems from the fact that the two essential properties of what is commonly called a "boundary" have never been distinguished. That is, boundaries are 1) local and 2) diacritic. The former seems to imply the latter – and this is exactly what I show to be wrong: there may well be non-diacritic

[1] The relation between the two theories at hand has always been unclear: why should morpho-syntactic information be handed down to phonology in two different ways? This question has been discussed by Selkirk (1984:412ss) and Inkelas (1990:37ss), who argue that Lexical Phonology is redundant and has to go. More recently, Distributed Morphology has taken the same position, while Bermúdez-Otero (froth) upholds dual transmission (see note 27). I discuss this issue at greater length in Scheer (forth).

boundaries. In other words, when boundaries were eliminated from phonological theory, the local baby was thrown out with the diacritic bath.

Hence I propose a theory where interface information is handed down locally – in the sense of what is traditionally called sandhi; yet the output of the Translator's Office are only truly phonological objects. A truly phonological object is one that exists in domestic phonology anyway and in absence of any interface-related issue. The result is Direct Interface, i.e. a theory where higher level information does not transit through a diacritic. A welcome effect of this is that different phonological theories, which of course have different domestic vocabulary, make different predictions as to what can be the output of the Translator's Office: only their domestic vocabulary is eligible as the output of the Translator's Office. Therefore, Direct Interface allows for evaluating phonological theories according to their behaviour at the interface – a new perspective.

The present article is the first published offspring of a larger body of work which is under way. While the result is the theory of Direct Interface that I introduce below, the present article concentrates on only one relevant predecessor – Prosodic Phonology. More discussion regarding the implementation into CVCV, the review of other interface theories since Troubetzkoy's Grenzsignale as well as of more empirical material will only be available in Scheer (forth).

The organisation of the article is as follows. In sections two to five, I critically review Prosodic Phonology, showing that its motivation lied in the will to follow the autosegmental movement which was ambient in the early 80s, rather than the discussion with boundary theory (section 3). The basic architecture and tenets of Prosodic Phonology are introduced in section 4, where it is also concluded that the Prosodic Hierarchy is a diacritic. Section 5 shows that non-isomorphism is a mirage provoked by an *a priori* in favour of domains. Sections 6 and 7 introduce what I believe are the minimal properties of a successful interface theory, and section 8 applies the result, Direct Interface, to a particular phonological theory, CVCV (Lowenstamm 1996, Scheer 2004). Some concluding remarks are made in section 9.

2. The roots of autosegmental prosodic domains

The earliest ancestors of Prosodic Phonology are commonly taken to be Liberman (1975) and Liberman & Prince (1977). The central idea of these authors is that segments are dominated by a multi-layered arboreal structure (syllables, feet and words) which expresses rhythmic (linguistically "musical") properties of the linear string and allows to assign relative prominence (strong vs. weak status) to individual chunks.

Based on this line of thought, Elisabeth Selkirk has developed the first model of Prosodic Phonology: she fertilised the autosegmental arboreal idea for the interface of phonology with higher modules, something that was not originally intended by Liberman & Prince (1977).

In Selkirk's early work (Selkirk 1978,1980a,b,1981a [1978],1981b) and especially in the ground-laying article Selkirk (1981a [1978])[2], the six-layer prosodic hierarchy which is still in place today was introduced: the syllable, the foot, the phonological word, the phonological phrase, the intonational phrase and the phonological utterance. Selkirk's proposals were influential, and mainstream phonology rapidly integrated them as a major contribution to the general expansion of the autosegmental idea. Her 1984 book (Selkirk 1984), though, which

[2] This article is commonly quoted as Selkirk (1978), hence as the oldest ancestor of Prosodic Phonology. Since the chronology sometimes matters below, I have added this date in square brackets. Actually, the content of this article was first presented at an Amherst conference in 1978; a manuscript almost identical to the 1981 publication has then been circulated since at least 1980. The first published version, however, is the text that appeared in the proceedings of the Nordic Prosody conference in 1981.

was advertised in all of her articles since 1978, has finally taken a different turn under the influence of Prince's (1983) grid-only approach: autosegmental prosodic constituency is evacuated altogether in favour of the metrical grid. Nevertheless, it constitutes a landmark of the early period of Prosodic Phonology, also because it assures a bridging function between the linear environment of SPE and the new autosegmental interface – an aspect that is further discussed in the following section. Finally, two years later, Selkirk (1986) returns to prosodic constituency, now arguing for a "peaceful coexistence" between the original prosodic hierarchy and the metrical grid (thus following Liberman & Prince 1977 and Nespor & Vogel 1982:226,1986).

Building on Selkirk's work but mobilising fresh data from languages such as Italian and Greek, Marina Nespor and Irene Vogel have grounded a parallel stream of inquiry: after an exploratory period (e.g. Nespor & Vogel 1979,1982,1983, Napoli & Nespor 1979, Nespor 1985,1986, Vogel 1982,1985), their 1986 book (Nespor & Vogel 1986) concentrates the insights gained. It rapidly became the authoritative reference in Prosodic Phonology, and indeed the standard theory of how higher modules communicate with phonology.[3] Still today it stands unchallenged: more than twenty years have gone by without any substantial modification of its basic tenets. The best means to judge the impressive success of Prosodic Phonology is the fact that its genuine units – the foot, the phonological word, the phonological phrase, the intonational phrase and the phonological utterance – have started out as theoretical constructions but today are common descriptive categories. Thus, just like for syllables, there may be different opinions on how exactly a phonological word is built and what it encompasses, but its existence is beyond doubt: there is an arboreal structure above the syllable that encodes morpho-syntactic information.

3. From boundaries to domains: a historical choice that has almost gone unnoticed

3.1. What boundaries are: diacritic and local

The influence of higher modules on phonological processes has always been conceived in terms of boundaries. Vocabulary may have varied a great deal according to the historical period and theoretical preferences (structuralists for example talked about juncture, or transition, disjuncture, schismeme etc.), but the essence of the object that assures the transmission of information has remained the same since the 19th century: *diacritic* and *local*.

Boundaries are local because they define the relation between two adjacent morphemes or words. This is the fundamental property that makes them different from domains, which by definition are non-local: they span a number of elements of the linear string, thereby creating labelled clusters. That is, an individual element of the linear string *belongs* to a domain, but it cannot *belong* to a boundary – one cannot even make sense of this expression. On the other hand, a boundary is precisely located in the linear string and can influence only adjacent objects: the one immediately preceding and the one immediately following. It does not make sense to talk about domains that intervene, or are located between two elements of the linear string. Domains, by definition, are non-local, while the very essence of boundaries is to be local.

Boundaries are also diacritic. This is evident as soon as they need to be put down on paper: their body is necessarily an arbitrary symbol. This property of boundaries has been long recognised in the literature (see section 3.3. below, e.g. Pyle 1972, Rotenberg 1978), and its undesirable consequences have been pointed out.

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[3] Of course, other authors have also contributed to the early period that has prepared Selkirk (1984) and Nespor & Vogel (1986): among others, Hayes (1989 [1984]) Booij (1983,1985a,b,1986) and Neijt (1985). Namely Hayes (1989 [1984]) was very influential.

I argue that the true difference between boundaries and prosodic domains does not regard their diacritic character. Rather, boundaries have a local action, while domains are non-local objects. This difference, however, seems to have gone unnoticed in the scarce Prosodic Phonology literature that talks about the replacement of boundaries by domains at all.

The conclusion, then, is that the fundamental change of perspective regarding the kind of object that carries interface information has never been seriously discussed: the diacritic and the local character of boundaries have never been disentangled. I show below in section 3.3 that on the grounds of their diacritic character alone (their bad aspect), boundaries have been thrown over board. Local intervention (their good aspect) has been eliminated on the same occasion. Contrary to this evolution, I argue that we need a local *and* non-diacritic intervention of higher modules in phonology.

3.2. Prosodic Phonology is a child of autosegmentalism: boundaries are ugly, domains are beautiful

Prosodic Phonology was born in the early 80s when the autosegmental idea turned the hitherto linear theory upside down. I intend to show that Prosodic Phonology is a direct consequence of the trend away from linear SPE towards autosegmental structure. In short, domains are the result of the application of autosegmentalism to the interface.

Elisabeth Selkirk has been working on the influence that morpho-syntactic structure has on phonology since the early 70s, mainly on the grounds of French liaison (Selkirk 1972 et passim). Assisting the advent of autosegmentalism, it seemed clear to her that the interface with higher modules needed to join the move: a situation where all areas of phonology (syllable structure, internal structure of segments) except its upper interface were progressively autosegmentalised would have been strange. As is shown by the quote below, Selkirk clearly identifies the elsewhere winning arboreal approach as the motor for the introduction of domains.

> "The syllables of phonological representation are arranged in some kind of hierarchical organization. […] By 'hierarchical organization' we mean, very roughly speaking, the organization of the units of phonological analysis into layers, vertically arranged on the same plane. […] This conception of phonological representation as having its own hierarchical structure(s) demands a radical rethinking of the relation between syntax and phonology. […] Thus the interpretation question – the question of the mapping between phonological representation and syntactic representation – takes on a much greater importance than in the standard theory, and has an entirely different quality to it. It must be viewed as a characterization of the relation between the syntactic hierarchy, on the one hand, and the phonological hierarchy (or hierarchies), on the other." Selkirk (1984:7s)

Therefore,

> "the junctural properties of sentences should be somehow represented 'suprasegmentally' rather than as the segmental boundaries of the standard theory. […] Thus the theory of phonological representation that we will advocate here eliminates segmental boundary elements altogether." Selkirk (1984:8)

Selkirk's description of the transition from boundaries to domains is precious since this historical break is by and large unreflected in the Prosodic Phonology literature. On the other hand, the existence of domains (the Prosodic Hierarchy) is usually taken for granted without discussion.

In the first sentence of their book, Nespor & Vogel (1986) for example merely state their disagreement with the linear SPE system that uses boundaries. They then go on talking about domain theory without making any argument regarding the transition.

> "In early generative theory, phonology was characterized by a linear organization of segments and a set of phonological rules whose domains of application were implicitly defined in terms of the boundaries of the surface morpho-syntactic constituent structure. […] It is our contention that this view of phonology is fundamentally inadequate. […] The subsystem [of phonology] we will be concerned with in the present study is the prosodic subsystem, and in particular, the theory of domains." Nespor & Vogel (1986:1)

Hence in 1986 boundaries are not considered a serious competitor anymore: the only status that they are granted is that of a strange archeological object. Since the transition from boundaries to domains is a fundamental break in phonological culture, I have read through the early Prosodic Phonology literature (i.e. until 1986) in order to find out whether there was any serious discussion of this critical issue at all.

3.3. The (absence of) discussion of boundaries in the Prosodic Phonology literature

The early Prosodic Phonology literature falls into three categories: most of the time the issue regarding boundaries is not mentioned at all; sometimes boundaries are declared inadequate without argument but referring to other articles; finally, arguments against boundaries are made in very few texts. The detail of the two former categories is discussed in Scheer (forth).

The latter category offers two (and only two) arguments. For one thing, Selkirk (1980a:126ss,1984:8ss) argues that domains are independently motivated by stress and rhythm since Liberman (1975) and Liberman & Prince (1977). Boundaries, on the other hand, are unable to encode stress and rhythmic properties of speech. Space restrictions preclude further discussion of this argument (see Scheer forth). Suffice it to say that the unification of stress, rhythmic properties and interface information may have been an issue in early models where prosodic constituency and the metrical grid were mutually exclusive (Selkirk's work until 1984). The argument has evaporated, however, since Prosodic Phonology has admitted the peaceful coexistence of both structures (Selkirk 1986, Nespor & Vogel 1986), and hence implicitly the fact that two different phenomenologies – domestic phonological properties such as stress and rhythm, against interface information – must not be conflated. Also, in Hayes' (1984) classical conception, rhythm is an emanation of metrical poetry and music, rather than of the linguistic system. Lying outside of linguistics, then, linguistic theory must not account for it.

The other argument, made by Selkirk (1980a,1986), Booij (1983,1985a) and Szpyra (1989), concerns the diacritic character of boundaries. Selkirk (1986:376) quotes Rotenberg (1978:16), who in a chapter called "Against Boundaries" indeed makes very convincing arguments: phonology can only interpret phonological objects (just as syntax syntactic objects and semantics semantic objects), not bananas or pink panthers (see section 5.2). His text actually echoes Pyle (1972), who had already used this line of reasoning. Thus it is certainly correct to call on Rotenberg as a voice against boundaries – but not in order to promote competing domains. Rotenberg tells us nothing at all when comparing the merits of boundaries and domains.

The case of Selkirk (1980a:126ss) is similar: she reviews the arguments made by Pyle (1972) regarding the overgeneration that boundaries introduce (as all the rest of SPE). Indeed, boundaries allow to formulate obnoxious rules that for sure lie outside of what natural language can do. The reason is as before: the only identity that one could think of for boundaries at that time was diacritic, and arbitrary symbols have not the same properties as linguistic objects. Hence this is but another version of the diacritic argument.[4]

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[4] The diacritic-overgeneration issue is usually brought up when the historical evolution from boundaries to prosodic constituency is described in more recent (overview) literature, e.g. Inkelas & Zec (1995:537s).

Selkirk then goes on considering a more serious competitor: McCawley's (1968) idea that boundaries define the domain of rule application, and that different boundary strengths determine different domains. Obviously, this is the simple translation of autosegmental domains into linear vocabulary – or rather, the new autosegmental perspective is the translation of McCawley's (1968) proposal. If both are just notational variants, the new prosodic hierarchy is certainly in trouble. At this point, Selkirk (1980a:128) says that "the relations among boundaries that are captured in the strength hierarchy must be stipulated in the theory. They do not follow from anything inherent to the notion of boundary in the theory". This is certainly true – but does the layering of prosodic constituents follow from anything in the theory of domains? Prosodic constituents exist because the related facts exist, and their size adapts to whatever is found out there. Hence just as much as boundary strength, domains merely record what happens.[5]

Finally, Szpyra (1989:11,182s) and Booij (1983:268s, 1985a:34) only offer some more variation of the diacritic argument.

In sum, thus, the major break with phonological practice since the 19th century has only been a topic of discourse in very few sources. Two arguments are made: one offers a true advantage of domains over boundaries but has become obsolete when Prosodic Phonology has agreed that stress and rhythm must not be unified with interface information. The other militates against diacritics in linguistic theory – exactly the right thing to do. Unfortunately, domains are also diacritics, if in an autosegmental coat. This is demonstrated in section 4.3 below.

4. Indirect Reference, mapping and the buffer

For the time being, though, let us admit the existence of domains. On these grounds, the present section introduces the founding statement of Prosodic Phonology (Indirect Reference), the consequences thereof (the existence of a Translator's Office as well as of mapping rules) and the way in which the various devices interact. This actually comes down to presenting the list of the classical issues in generative interface theory. The central claim, Indirect Reference, irradiates phonological thinking since SPE (as much as the phonological cycle, which is not a first class topic in Prosodic Phonology). I recall below in section 5 that Indirect Reference is just as relevant today as it was in the 70s and 80s: as long as grammar is thought of in terms of modules, it is a necessary condition for any interface theory.

4.1. Indirect Reference and the buffer: morpho-syntactic structure in a diacritic coat

Indirect Reference holds that morpho-syntactic structure is invisible to the phonology. Phonological processes cannot make direct reference to higher level categories. Indirect

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[5] Hayes (1989 [1984]:203ss) makes a similar point. He takes the two following observations for granted: 1) if a phonological rule can apply across one kind of boundary, it can also apply across all "weaker" boundaries; 2) if a rule applies before of after one kind of boundary, then it also applies before or after all "stronger boundaries". Hayes' argument, then, is built on the claim that boundary-based theories must make two independent stipulations in order to capture the facts, whereas domain-based theories need only one stipulation that covers both observations, the Strict Layer Hypothesis. If it is true that boundary strength notations and arboreal autosegmental representations can always been converted into one another, Hayes' claim must be wrong. And indeed, in a linear string with boundary symbols representing two different strengths such as $\#_2\#_1 \ldots \#_1 \#_1 \ldots \#1\#_2$, a process that applies within the "domain" delimited by $\#_2$ will also apply in all embedded $\#_1$-demilited domains (but not the reverse). Also, if a process applies before a $\#_1$ boundary, it will necessarily apply before a $\#_2$ boundary as well since $\#_2$ is always preceded by a $\#_1$ (the reverse being not true).

Reference is present since the earliest incarnations of Prosodic Phonology and germane to all of its versions.[6]

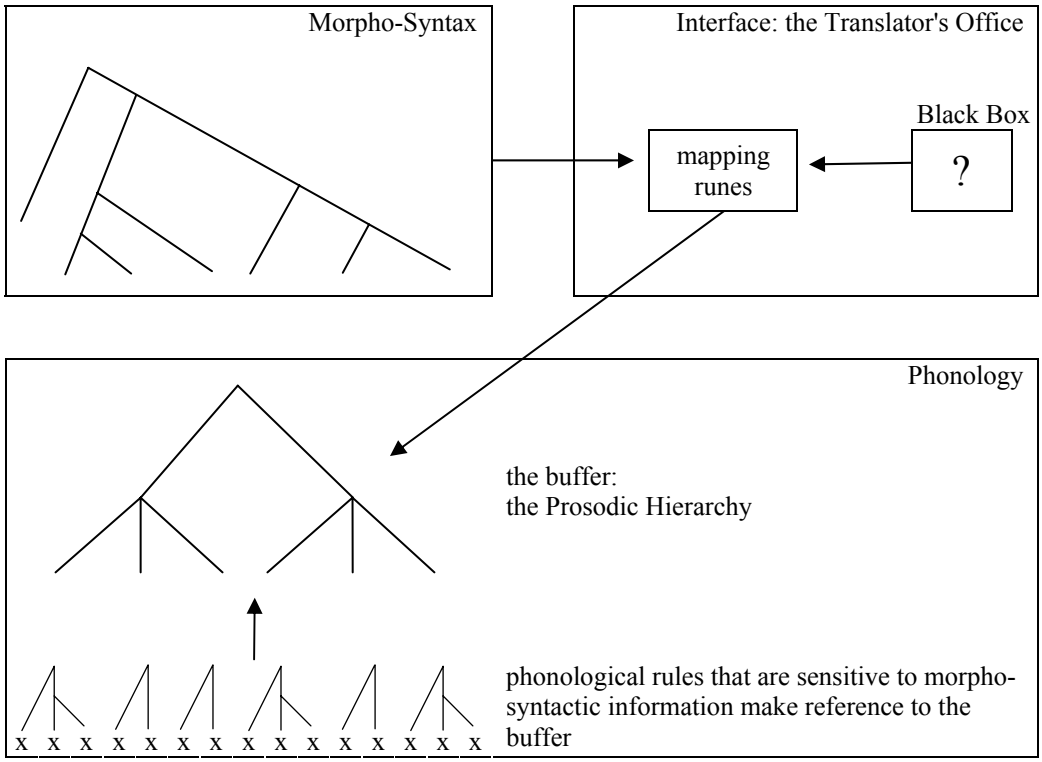
If it is true that phonology has no direct access to morpho-syntactic structure, higher level information needs to be transformed into items that are part of the phonological world. This translation is done by so-called mapping rules, whose input is the morpho-syntactic structure (and also what I call the black box, on which more below). They return the arboreal constituent structure of Prosodic Phonology, which lies inside the phonological module.

I call this output the buffer (or sponge) because it is located in the phonological module but has no phonological origin nor carries any phonological information.[7] Prosodic constituency only takes stock of morpho-syntactic structure, which therefore becomes visible to the phonology. In other words, the buffer is the instrument of Indirect Reference: phonological rules that are sensitive to morpho-syntactic structure make reference to the representative of higher modules in phonology, not to morpho-syntactic categories themselves.

4.2. The buffer and its construction workers: mapping rules and the black box

Let us now look at the place of the buffer in the overall architecture of Prosodic Phonology. Consider table (1) below.

(1) general architecture of Prosodic Phonology



[6] Theories that disagree with this statement are called direct syntax approaches. They are most prominently represented by Kaisse (1983,1985) and Odden (1987,1990); space restrictions preclude further discussion.

[7] As far as I can see, the only phonological information that has been claimed to sometimes contribute to the definition of prosodic constituency is the length of items in the linear string. A case in point is discussed in section 5.5, showing that the evidence is not conclusive, and that the literature offers alternative analyses which are based on morpho-syntactic factors, rather than on length.

The buffer is created by mapping rules, which do their job on the grounds of two sets of information: the output of morpho-syntax and what I call the Black Box. The existence of such a Black Box is absolutely crucial for Prosodic Phonology since it is a consequence of the only argument that makes the buffer necessary, so-called non-isomorphism. As we will see in section 5.3, Prosodic Phonology holds that the domains to which phonological rules make reference sometimes do not match any morpho-syntactic division: phonological and morpho-syntactic domains may be non-isomorphic. Since the objects that phonological rules make reference to thus do not always exist at the end of morpho-syntax, they need to be created by a translating mechanism, the mapping rules. Mapping rules make sovereign decisions in order to eventually rearrange the morpho-syntactic input – this is the source of non-isomorphism. It is these readjustment decisions that I call the Black Box. Also, this label refers to the mystery that is associated with readjustment: linguists do not really understand the particular grouping of morpho-syntactic units (called phonological phrasing in Prosodic Phonology) that is relevant for the phonology.[8]

Finally, a historical point is in order: it is not difficult to see that all major concepts used in Prosodic Phonology have already been proposed by Chomsky & Halle (1968). The readjustment rules of SPE (see also Langendoen 1975) appear as mapping rules in Prosodic Phonology. Also, the idea that phonology does not make direct reference to the output of the syntactic component is explicit in SPE.[9]

> "It appears that the syntactic component of the grammar generates a surface structure Σ which is converted, by readjustment rules that mark phonological phrases and delete structure, to a still more superficial structure Σ'. The latter then enters the phonological component of the grammar." Chomsky & Halle (1968:9s)

At least in some cases, say Chomsky & Halle, is phonology unable to make direct reference to morpho-syntactic structure Σ. Rules then target a readjusted surface structure Σ' which is the true input to the phonology. The motivation for this take is given on pages 371s of SPE: exactly what is called non-isomorphism in the vocabulary of Prosodic Phonology (more on this in section 5.3). The contribution of Prosodic Phonology, then, is to make Indirect Reference systematic: while SPE makes direct reference to morpho-syntactic structure when isomorphism is encountered and recurs to readjusted Σ' only in case of need (non-isomorphism), Prosodic Phonology proposes to systematically create a readjusted Σ' (the Prosodic Hierarchy), even if direct reference would be possible.

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[8] Morpho-syntactic conditions on Mapping have been seriously investigated mostly in the 80s and early 90s where case studies have tried to bring to light cross-linguistic regularities. This has often been done upon the inspiration of Selkirk's (1986) end-based theory: among others, Neijt (1985) on Dutch, Cowper & Rice (1987) on Mende, Vogel (1988) on Hungarian, Condoravdi (1990) on Greek. Nevertheless, mapping is still poorly understood, and rules seem to be inflational as much as anarchic: no relevant pattern seems to emerge. This foggy part of the theory has been carried over to OT, where mapping is not any better understood, and empirical studies have turned away from morpho-syntactic conditions in order to look at other factors such as focus, topic and eurythmy (Selkirk 2000).

[9] Also in the overview article by Dresher (1996:41ss), while the Prosodic Phonology literature typically (but not always) presents Indirect Reference as a genuine achievement, sometimes even as an improvement over SPE (sic), e.g. "In an SPE-type model of phonology, the only way of representing the domains of a phonological rule is in terms of morphosyntactic constituents, the implicit claim being that such constituents are, in fact, the only domains in which phonological rules may apply" Vogel (1986:59). More sources of this kind are collected in Scheer (forth))

4.3. The buffer is a diacritic – an autosegmental diacritic

Vogel & Kenesei (1990:344) review the arguments in favour of Indirect Reference, the heart of Prosodic Phonology. One point they make is a historical one: all interface theories have been indirect thus far, so there is probably something to this approach. They namely single out SPE as a predecessor of Indirect Reference.

> "Working within the SPE framework, Selkirk [1972] modifies the original proposal by showing that at least in certain types of phonological phenomena, interaction between the two components is only indirect. Word boundaries (#'s) inserted into a string on the basis of syntactic structure determine where external sandhi rules apply. Phonological rules thus do not directly 'see' syntactic structure, but rather access only strings of segments and boundaries." Vogel & Kenesei (1990:344)

Hence the equivalence between #s and the modern prosodic arborescence is not only obvious; it is claimed as an argument by representatives of Prosodic Phonology.

The same line of reasoning is found in the overview article by Inkelas & Zec (1995): they call p-structure the level of representation that mediates between morpho-syntax and phonology and explicitly identify boundaries as the ancestor of its more recent prosodic incarnation:

> "An early version of p-structure was proposed in SPE and developed in subsequent work (Selkirk 1972,1974; Rotenberg 1978). According to this view, domains of phonological rules are expressed in terms of phonological boundary symbols, generated by rules. […] Far more constrained is the 'prosodic' view of p-structure. Under this view, p-structure occupies a level with its own hierarchical organization and a high degree of autonomy." Inkelas & Zec (1995:537s)

If, thus, prosodic constituency is but a more advanced version of boundaries that presents a number of advantages, it must have the same formal properties as its predecessor. The two quotes clearly show that prosodic constituency, just as hatch-marks, is a diacritic: it serves no other purpose than replicating the phonologically relevant morpho-syntactic information in the phonology. Although proponents of Prosodic Phonology are prompt to point out that boundaries are odd because they are diacritic and hence arbitrary, nobody ever examines the status of the buffer in this respect, even when it is advertised as the direct surrogate of arbitrary boundaries.

That the Prosodic Hierarchy is a diacritic may also be seen when comparing its birth and life with boundaries. Just as these, it is the output of the translational process that takes place in the Translator's Office. Just like these, the Prosodic Hierarchy is a UFO in the phonological module: it is injected for the exclusive purpose of storing extra-phonological information. Domestic phonology, i.e. the one that runs without any extra-phonological conditioning, does not accommodate either boundaries or prosodic constituency. Finally, just like boundaries, the units of the Prosodic Hierarchy are arbitrarily chosen and named: "ω" (the phonological word), "φ" (the phonological phrase) etc. are not any less arbitrary than "+" and "#". For some reason, however, people always point out the arbitrariness of the typewriting symbol "#", but do not react in the same way when talking about omegas.

Saying that an omega is only shorthand for a real linguistic object, the phonological word, does not help either: the same may be said about + and # – only that a regular scientific-sounding terminology has never been introduced for these objects. And of course, pointing out that they represent certain stretches of the linear string which coarsely correlate with morpho-syntactic divisions does not make omegas and phis less arbitrary. For one thing, this only shows that their only purpose is to replicate morpho-syntactic structure in phonology. But more importantly, the same may be said about boundaries – and actually *has* been said about boundaries (by McCawley 1968: see section 3.3): + and # represent two different

boundary strengths, the latter dividing larger chunks of the linear string. If more boundaries are added to the list, they may also be correlated with increasing chunks of the linear string that coarsely represent morpho-syntactic divisions.

Hence to all extents and purposes, "#"s and "omegas" have the same status: they are non-phonological intruders in the phonological world whose only purpose is to store extra-phonological information. They are necessary in order to fulfil the promise of Indirect Reference. For some strange reason, though, the former are stigmatised as arbitrary diacritics, while the latter are sold as "truly phonological objects" (e.g. Selkirk 1984:32,409s, Nespor & Vogel 1986:27ss,110ss). For example, Nespor & Vogel (1986:3) call boundaries "pseudo-phonological terms" and argue that phonology should only be able to refer to truly phonological objects (just as syntax can only make reference to truly syntactic objects). This is certainly a position that one can only haste to applaud: diacritics do not qualify. Only did it not occur to Nespor & Vogel (1986), no more than to any of their followers as far as I can see, that the Prosodic Hierarchy is a pseudo-phonological object as well.

Reading through the literature, I could only find one voice that clearly identifies the buffer for what it is. Without surprise, this voice comes from the quarters of the direct syntax approach (see note 6) where of course no buffer is needed: Kaisse (1990:128) calls attention to the redundant and diacritic character of prosodic constituency, pointing out that the direct syntax option "does not require the postulation of constituents that are needed only to describe the sandhi phenomena in question."

It thus appears that there is just one difference between the usual diacritics and omegas: the former are linear and local, while the latter are autosegmental, hence non-local units. Therefore the progress since SPE does not concern the Indirect Reference to morpho-syntax, nor the diacritic notation of phonologically relevant morpho-syntactic units; rather, it comes down to a change from a linear to a non-linear perspective on the action of higher level information. This, then, takes us back to what I believe is the historical *raison d'être* for Prosodic Phonology (section 3.2): a general antipathy against linear objects, which arose in the general movement that autosegmentalised the entire phonological space in the early 80s – and was consequently applied to the interface as well.

The linear vs. non-linear debate in the realm of interface theory is worthwhile – unfortunately it has never been led. I argue below that only a linear perspective is viable: higher level information has a local action exactly in the tradition of what is known as sandhi. Only must this information not materialise as a diacritic. Rather, the output of the Translator's Office can only be truly phonological objects – those that exist in the phonology independently of any issue related to the interface. This is what I call Direct Interface.

5. Good and bad reasons for Indirect Reference

5.1. The buffer appears to be redundant: it needs a real good motivation

Prosodic Phonology thus supposes that the phonology is burdened with extra arboreal structure plus the relevant mapping rules. It is also clear that this load serves no other purpose than the one it was created for: to make morpho-syntactic structure available inside the phonological module; the buffer is an interface and nothing else.[10] By contrast, the competing

[10] It is true that the Prosodic Hierarchy has also been used for purposes that concern only domestic phonology. For one thing, this can only be done once the Prosodic Phonology has been created, and its genesis is due to interface reasons alone. Also, if diacritics do not qualify and hence the Prosodic Hierarchy does not exist, of course I must claim that any analysis which uses prosodic constituency is a misanalysis. One case in point is Rubach's (1997 et passim) account of so-called trapped consonants in Polish (see Scheer 2004:§240, in press), which he argues are extrasyllabic (even in the middle of words). On Rubach's analysis, these

solution that makes direct reference to morpho-syntactic structure (e.g. Kaisse 1985, see note 6) achieves the same result without any additional structure or computation.

A bare assessment of both directions will thus disqualify Prosodic Phonology without any hesitation: why having a very significant amount of additional structure and extra computation without any need? It is thus absolutely vital for Prosodic Phonology to be able to dismiss the obvious objection (made for example by Kaisse 1985:156 note 1, 110 note 1, Kaisse 1990:128s) according to which the only effect of the Prosodic Hierarchy is to invent unnecessary and redundant objects. In other words, the question why phonology should be unable to directly refer to morpho-syntactic structure must be answered.

5.2. A good reason: modularity

Modularity is certainly the first answer to be thought of. Indeed, the modular structure of grammar implies that a module cannot see what is going on in another module: we are talking about autonomous and ontologically distinct entities which do not take into account either the structure of other modules or even their existence. Literature on the modular architecture of grammar abounds; Jackendoff's (1992 et passim) version for example is called *Representational Modularity*.

The ontological gap between phonology and morpho-syntax grounds the principle of phonology-free syntax (among many others, Zwicky & Pullum 1986, Miller et al. 1997) which has become the standard view of the macro-situation regarding modular identities. In its strong version, it observes that syntax, semantics and morphology are deaf for any phonological information: there is no syntactic, morphological or semantic process that has a phonological conditioning. For example, there is no syntactic movement on record that would be triggered only if, say, the candidate begins with a labial. The same holds true for all other categories that are relevant in phonology such as palatality, occlusion, syllabic constituents or skeletal slots. A weaker version of phonology-free syntax distinguishes between melody (i.e. phonological objects located below the skeleton) on one hand and syllabic as well as prosodic properties on the other. Indeed, if the inability of melody to bear on higher modules is an undoubted fact, syllabic and prosodic properties have been argued to condition morphological and syntactic processes (e.g. Inkelas & Zec 1990,1995, Szendröi 2003).

Hence at least melody is entirely invisible for higher modules. One is thus founded to say that there is a deep ontological gap between phonology and the other modules. That this gap is actually deeper than the one that may exist between any other two modules appears when considering how these are communicating. That is, number, person, case, animacy, quantification, aspect and so forth are categories that are used, understood and processed by syntax as much as by morphology and semantics. In this sense, thus, syntax, semantics and morphology speak the same language. Much unlike phonology, which of course does not know what number, person and so forth are.

In sum, thus, we face a situation where two macro-modules, morpho-syntax and semantics on one hand, phonology on the other, are incommunicado. We do know for sure, however, that there is communication among them: at least top-down, i.e. where phonology

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consonants end up being directly attached to the Prosodic Word. One suspicious feature of this scenario is the existence of extrasyllabic consonants in the middle of morphemes (in violation of the Peripherality Condition, e.g. Clements 1990:290, Hayes 1995:57s). Also, a wrong prediction is made to the effect that some natural language could allow for three, five, eleven or a hundred extrasyllabic consonants in a row: since nobody has ever defined any co-occurrence restrictions for segments that are attached to Prosodic Words (obviously because this is also in violation of the Strict Layer Hypothesis), any number of consonants should be able to be accommodated.

receives orders from higher modules. Obviously, then, this supposes a Translator's Office where the morpho-syntactic language is translated into the phonological idiom. Poor phonology could not possibly react on an order issued in the morpho-syntactic language: it would not understand what it is told. Only phonological objects can have a phonological effect.

On a more general note, this is a central point in Jackendoff's work: a module can only understand its own language (of the brain), and two different languages cannot coexist within the same module.

> "'Mixed' representation[s] should be impossible. Rather, phonological, syntactic and conceptual representations should be strictly segregated, but coordinated through correspondence rules that constitute the interfaces." Jackendoff (1997:87ss)

If implicitly and timidly on most occasions, modularity and the fact that phonology does not speak the same language as other modules has been invoked in the Prosodic Phonology literature (e.g. Selkirk 1984,32,409ss, Nespor & Vogel 1986:27ss,110ss). Typically, modularity is hinted at when the Prosodic Hierarchy is compared with boundaries: Nespor & Vogel (1986:3) for example call boundaries "pseudo-phonological terms" and argue that phonology should only be able to refer to truly phonological objects (just as syntax can only make reference to truly syntactic objects).

As far as I can see, on no occasion, however, is modularity explicitly used in order to sustain Indirect Reference. The only argument invoked – over and over again in the literature (e.g. Selkirk 1980a:110,1981a [1978], Nespor & Vogel 1982:226, Nespor & Vogel 1986:37ss, Hayes 1989 [1984]:201, Nespor 1985, Neijt 1985:180, Booij 1985b:149) – is non-ismorphism, a bad argument as we shall see.

5.3. A bad reason: non-isomorphism

Non-isomorphism builds on the observation that in some cases, the domains to which phonological rules make reference are not co-extensive with any morpho-syntactic domain. Or, in other words, some phonological rules make reference to information that does not exist in the morpho-syntactic surface structure. Therefore, the argument goes, there need to be a readjusting mechanism that further transforms the output of morpho-syntax in such a way that the divisions needed for phonology are created. This job is done by the mapping rules whose output, the buffer, provides the adequate target for the reference of all phonological rules that are sensitive to morpho-syntactic information.

The argument based on non-isomorphism has been made since Selkirk's (1981a [1978]) very first article and runs through the entire Prosodic Phonology literature. Let us thus look at the empirical basis of non-isomorphism.

Nespor & Vogel (1986, all through the book: 4s,34ss,124ss etc.) are very conscious that their theory stands and falls with non-isomorphism. They therefore devote a lot of ink for making the argument, which is illustrated by empirical evidence from various languages. Two cases are discussed below. They are chosen on account on their significance and notoriousness: one, the *cat-rat-cheese* example, goes back to Chomsky & Halle (1968:371s) and since Nespor & Vogel (1983:130ss,1986:57s) has become the standard argument which is always repeated in the literature when non-isomorphism is recalled (e.g. Vogel & Kenesei 1990, Nespor et al. 1996, Dresher 1996:42); the other, "phonology over sentences", also runs through the literature until today. We will see that neither argument bites.

Compare the major syntactic divisions of the sentence under (2)a with its intonational structure under (2)b.

(2) a. This is [the cat that caught [the rat that stole [the cheese]]]
b. [This is the cat] [that caught the rat] [that stole the cheese]

The two lines of division do not coincide. Hence, goes the argument, whatever drives phonology to decide that the intonation is as under (2)b, it is not the output of the syntactic module. There is no node in the syntactic tree that uniquely dominates every intonational span of the sentence, nor could syntactic theory evolve in a way so to achieve this goal. Hence the relevant intonational structure must be created outside of the syntax by some interface: the mapping rules.[11]

The second argument targets another unmodifyable property of syntactic structure: the fact that two sentences are not dominated by any node. Hence it is impossible to describe a phonological event at the break of two sentences in terms of domains: the domain within which it applies, a string encompassing two sentences, cannot be expressed in terms of syntactic arborescence.

A relevant phonological process presented by Nespor & Vogel (1986:4s) is linking r in English (which has gained much attention in the OT literature, e.g. Halle & Isardi 1997). In certain non-rhotic varieties such as Received Pronunciation, etymological r remains unpronounced utterance-finally and before consonant-initial morphemes and words (*mothe*[r]*, *mothe*[r]ly*, *my mothe*[r] comes*), but appears before vowel-initial morphemes and words if the intervening boundary allows for the linking effect (*mothe[r]ish*, *my mothe[r] is coming*). The critical fact for the demonstration at hand is that linking r may also appear at the break of two sentences, as shown under (3) below (examples are from Nespor & Vogel 1986:4s,46s, data and argument are developed at length in Vogel 1986).

(3) a. There's my mothe[r]. I've got to go.
b. There's my mothe*[r]. I've got two cats.

Nespor & Vogel contrast (3)a where the r may be linked with (3)b where according to them no r may be pronounced. The difference, they say, is of semantic kind: the semantic relation between the two sentences under (3)a is close; by contrast the greater semantic distance under (3)b prohibits the appearance of the linking r in otherwise identical conditions.

Nespor & Vogel (1986) conclude that phonology makes reference to a domain which does not exist in syntax. The relevant structure must therefore be constructed by the interface mechanism, i.e. the mapping rules. That is, r is only linked within a phonological utterance, and too much semantic distance between two sentences does not allow a single phonological utterance to span them.

5.4. Domain abuse I: there is no argument when phonology refers to boundaries instead of domains

The argument built on non-isomorphism is certainly correct – but only if it is taken for granted that phonological rules make reference to domains, rather than to boundaries. That is,

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[11] As was mentioned earlier, this example as well as non-isomorphism altogether originates in SPE:
"Consider, for example, sentences such as (124), where the three bracketed expressions are the three noun phrases in the predicate:
(124) This is [the cat that caught [the rat that stole [the cheese]]]
Clearly, the intonational structure of the utterance does not correspond to the surface structure in this case. Rather, the major breaks are after cat and rat ; that is, the sentence is spoken as the three-part structure this is the cat – that caught the rat – that stole the cheese. This effect could be achieved by a readjustment rule which converts (124), with its multiply embedded sentences, into a structure where each embedded sentence is sister-adjoined in turn to the sentence dominating it." Chomsky & Halle (1968:371s)

(non-)isomorphism in the Prosodic Phonology literature is always understood as a comparison between domains: morpho-syntactic and phonological. While it is certainly true that morpho-syntactic organisation is arboreal, absolutely nothing entitles us to assert *a priori* that the aspect of its structure which is projected into the phonological module are non-local domains, rather than local boundaries.

We are thus invited to look at the same facts through the glasses of local boundaries that have been left unconsidered in the Prosodic Phonology literature. The effect is quite striking: non-isomorphism evaporates. In the sentence under (2) for example, intonational units simply begin with every CP. Hence it is enough to say that the intonation-building mechanism starts a new unit every time it hits the phonological translation of the CP-boundary. Intonational and syntactic structure are thus perfectly isomorphic, and no extra constituency on the phonological side is needed.

The same holds true for the case of linking r: the point made by Nespor & Vogel relies on the absence of a domain that encompasses two sentences. If boundaries are the unit to which phonological rules make reference, however, no sentence-spanning domain is needed: the contrast observed then stems from the different boundaries that separate the two sentences at hand and denote their variable semantic relationship.

When going through the evidence that has been produced in order to support non-isomorphism (among many others, Selkirk 1981a [1978],1981b,1984:27s,1986, Nespor & Vogel 1982, Nespor 1985, Hyman et al. 1987, Rice 1987, Vogel & Kenesei 1987, Nespor & Vogel 1986:36ss, Nespor et al. 1996:7), the result is always the same: the regularity which is formulated in terms of domains can as well be described with boundaries and then of course turns out to be perfectly isomorphic: boundaries necessarily correspond to some morpho-syntactic division. Thus case after case, non-isomorphism turns out to be an artefact of the domain-inclined analysis, rather than a fact about the relation between phonology and morpho-syntax.

In sum, thus, prosodic constituency and the claim that phonological rules make reference to domains is a self-fulfilling promise: once domains exist, the argument based on non-isomorphism can be made to the effect that we need the Prosodic Hierarchy. Non-isomorphism, however, disappears if phonological rules make reference to boundaries. Since non-isomorphism is the only argument for the buffer, the entire parallel world of prosodic constituency turns out to be superfluous. On top of that, there is reason to believe that boundaries, the interface currency from time immemorial, have not been abandoned for the sake of any good reason, but because they exhaled an unpleasant linear smell (section 3.2). Hence it is certainly worth a try to reinstall boundaries in their rights. The question, then, is how to throw out the (diacritic) bath without the (local) baby.

5.5. Domain abuse II: theoretical units are confused with descriptive categories

The best witness of the tremendous success of Prosodic Phonology, I believe, is the fact that the units of the Prosodic Hierarchy have by and large acquired the status of descriptive categories. This is true in general for conversations among phonologists: the morpho-syntactic distance of two units across which some phonological process applies is commonly identified by its prosodic translation ("X applies within a phonological word"), rather than by its morpho-syntactic properties. This way of looking at sandhi phenomena is so deeply rooted in the field that boundaries are not even mentioned, let alone considered. A typical example is the first sentence of Vogel & Kenesei (1987):

> "When a phonological rule applies across words, it is necessary to be able to specify across which types of words it may apply and across which it may not, or in other words, within which domain it applies." Vogel & Kenesei (1987:243)

Equating "applies across words" with "applies within a domain" without discussion has unfortunate consequences: basic empirical generalisations may be missed. Below I discuss one case in point where the undue usage of domains as a descriptive category introduces a bias into the analysis.[12]

Nespor & Vogel (1986:42ss) examine a process in Spanish whereby the nasal of a nasal-obstruent cluster that straddles a word boundary may come to agree in place with the obstruent. They provide two examples where homorganisation goes into effect when the two words in question are a verb followed by an object NP, and a verb followed by an adjective, respectively. From this, Nespor & Vogel conclude that the domain of application of the homorganisation rule is "within the VP". They then introduce additional evidence that appears to violate this generalisation: there is no homorganisation between an object NP and a following preposition. Their conclusion, then, is that Spanish provides further support for the otherwise well established pattern according to which phonological processes are more easily blocked when their domain of application, the VP in this case, is long (i.e. contains many words).

This analysis may be correct, but in order to tell we would need to examine the case of an object NP-Prep boundary that does not make the VP too long. If this is not possible, the matter may not be decided since the blocking effect may either be due to the length of the VP or to the object NP-Prep boundary. In any event, declaring that the domain of application of a rule is the VP without having tested all possible VP-internal boundaries is confusing boundaries – the only descriptive unit that is given to the analyst – and domains, a the derived category.

Hence there is reason to believe that the alleged length sensitivity of phonological phrasing that wanders through the literature since Nespor & Vogel (1986) is an artefact of the domain-biased analysis, rather than an empirical fact. This is of some relevance for the demonstration that the Prosodic Hierarchy is a diacritic. Recall from section 4.1 and note 7 that the only phonological factor which has been claimed to participate in the construction of prosodic constituency is precisely the length of morpho-syntactically identical strings. If this were true, the Prosodic Hierarchy could not be said to be a 100% pure morpho-syntactic buffer.

Four comments are in order here. For one thing, it is *never* the case that the alleged "short" and the alleged "long" portions of the string are morpho-syntactically identical. This is precisely the flaw in the analysis of Nespor & Vogel (1986:42ss) that was pointed out above: the "longer" string has also more internal morpho-syntactic structure; hence these additional boundaries, not length, could well be responsible for the effect observed.[13] And if one is to choose between a theory where all phonological phrasing is done on purely morpho-syntactic grounds and another one where mapping is 98% morpho-syntactic and 2% size-dependent, the latter will surely not win the linguists' heart.

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[12] This not withstanding, most of the work in Prosodic Phonology that I have come across proceeds in a way that is methodologically sound, i.e. by first establishing the list of boundaries which have a (non-)blocking effect in regard of some phonological process, and then converting this list into the categories of the prosodic constituency.

[13] The same holds true at the morphological level. When I talked this issue over with Ricardo Bermúdez-Otero, he brought up the following contrast: in the frame "… requires us to think again about these issues", a phrase-initial NP subject such as "contemporary thought" is less likely to constitute a separate intonational phrase than "contemporary antidisestablishmentarianism". He concludes that size matters and tends to cut identical objects into smaller prosodically relevant portions. Now the thing is that *antidisestablishmentarianism* and *thought* may be identical on the syntactic side – they are certainly not on the morphological side. Hence nothing guarantees that it is the size, rather than the additional internal structure, which produces the effect. A test case would be two monomorphemic items with very different length.

Also, it is not clear in which way "size" is a phonological category. Of course phonology has no means to know how long a word or a morpheme is. Phonology is unable to count such things. And "size" is nothing that is known in domestic phonological quarters: there is no phonological process, say palatalisation, vowel harmony or the like, that depends on the length of something. Hence if anybody decides on what is long and what is short, it is surely not the phonology. The only instance that can make such a decision is the Translator's Office.

Third, alleged size restrictions always seem to concern either the phonological phrase or the intonational phrase. There is no good reason why this should be so: if mapping may be size-sensitive, this option should at some point be visible at all levels of the Prosodic Hierarchy.

Finally, the original size-based generalisation has long been reanalysed in the literature either along the lines discussed, or according to eurythmic properties of speech. Ghini (1993) is at the origin of the latter line of thought, while Sandalo & Truckenbrodt (2002) for example argue for the former solution (the authors use a constraint WRAP-XP which requires that each XP is contained in a phonological phrase, thereby exploiting the additional structure of "long" items).

In sum, thus, there is little evidence for and yet less appeal to analyses where the "phonological" property of length contributes to the construction of prosodic constituency.

6. Conclusion so far: translation yes, buffer no

The foregoing discussion may be summarised like this: we need a Translator's Office, but the buffer has to go.

The Translator's Office must be located in modular no-man's land (i.e. neither in morpho-syntax nor in phonology) and makes sovereign decisions (which are still poorly understood: mapping). Prosodic Phonology thus did exactly the right thing – introducing Indirect Reference as a major principle of the interface architecture, installing a Tranlator's Office and mapping rules – but for the wrong reason. Non-isomorphism is a non-reason: it exists only if way is given to the unsupported *a priori* that non-local domains are the operative interface currency; it evaporates when higher level information is supposed to be handed down through local intervention at the seam between two morphemes or words. The reason that really enforces the existence of Indirect Reference, the Translator's Office and mapping is modularity and the concomitant fact that phonology does not speak the same language as syntax, morphology and semantics. That is, any direct transmission of morpho-syntactic information to the phonology would simply remain without effect since it could not be interpreted.

The traditional interface currency, boundaries, has been evacuated in favour of domains with no good reason and hardly any discussion, in any event in absence of contrastive argumentation comparing the merits of both options. The diacritic argument levelled against boundaries was made in the erroneous belief that the alternative, domains, are non-diacritic. Diacritics are to be done away with, that much is for sure. The Prosodic Hierarchy is a diacritic as much as SPE-type boundaries – hence both have to go.

The key to the problem, then, is the fact that the diacritic character of boundaries is but one aspect of their identity. It has constantly been confused with the property that really sets them apart from domains: their local action. The question, then, is how a local intervention of higher modules can be achieved without appealing to diacritic objects.

7. Direct Interface

This section introduces the basic tenets of Direct Interface. Direct Interface is a general interface theory that distinguishes two different ways of influencing the course of phonology: procedurally and representationally. The former is not under focus in this article; it roughly consists of a version of the phonological cycle (of phase in more modern terms). The latter defines 1) how extra-phonological information is shipped into the phonology, 2) where precisely this information can land and 3) what it may consist of.

It is important to note that Direct Interface is theory-neutral with respect to phonological theories. It defines a general frame for the interface, which then may be occupied by any particular phonological theory. Different theories have different vocabulary and promote different representational objects – and therefore make different predictions as to what is a possible interface event. An appreciable effect of Direct Interface is thus that phonological theories may be evaluated according to their behaviour at the interface. Other interface theories such as SPE, Lexical Phonology or Prosodic Phonology do not offer this opportunity because their heart is to impose precise properties that cannot vary across candidate phonological theories: "#"s, levels, brackets, prosodic constituents and the like – in short, a diacritic. Rather than imposing some interface vocabulary to all competing phonological theories, Direct Interface works with whatever the theories offer - precisely because it outlaws diacritics and could not process any non-domestic object.

7.1. No mediation: only domestic phonological objects can be the output of the Translator's Office

As indicated by its name, Direct Interface holds that there is no intermediate unit between the Translator's Office and phonology: neither # nor omega nor any other diacritic. The output of the Translator's Office are only truly phonological units. Since the Prosodic Hierarchy has been erroneously sold as a truly phonological unit, it is necessary to precisely define this notion.

(4) A truly phonological object is a unit that is needed for the purpose of domestic phonology and in absence of any issue related to extra-phonological information.

The objects that qualify are of course theory-dependent, but things such as "labial", "Onset", "Nucleus", "association line" and so forth will probably be consensual across models. Obviously, neither # nor omegas qualify as a truly phonological object since they are introduced into the phonology only when reference to extra-phonological information needs to be made: they do not serve any other purpose. Domestic phonology such as a trivial palatalisation for example does not need to recur to #s or omegas. That #s and omegas are no phonological animals is also obvious from the fact that they are created outside of the phonology, i.e. in the Translator's Office, and without contribution of any phonological information.

7.2. Representational and procedural labour of the Translator's Office

Another question is how labour is divided between the representational and the procedural action of the Translator's Office. There is good reason to believe indeed that the interface acts on phonology along both of these lines. As was stated in the introduction, due to space restrictions this article concentrates on the heritage of Prosodic Phonology, leaving the other important interface theory, Lexical Phonology, for other occasions (Scheer forth). Now these two theories are quite clearly complementary in their treatment of the two properties at hand:

Prosodic Phonology is a representational theory of the interface, while Lexical Phonology cares about procedural aspects. Since SPE (actually since Chomsky et al. 1956), the latter are known as the phonological cycle, nowadays as phase theory when looked at from above.

The focus chosen in this article thus is naturally representational. Of course this does not mean that the phonological cycle need not be considered. Direct Interface expresses both aspects: the Translator's Office may act on the phonology in the two ways described under (5) below.

(5) actions that the Translator's Office may take
   a. representational
      it may send down an object to the phonology. This object is a truly phonological unit and will be inserted at the boundary of two morphemes or words. Its action therefore is only local.
   b. procedural: chunk submission
      it may decide to submit only a chunk of the total linear string to the phonology, and to repeat this action several times with variously sized chunks (from smaller to bigger, climbing up the morpho-syntactic tree). Every time phonology receives some chunk, it assigns phonological interpretation to it. Obviously, chunk-submission is not local in character.

The point of view taken under (5)b has a number of consequences that due to lack of space cannot be discussed in detail. Suffice it to point out the following. Obviously (5)b is incompatible with interactionism, the heart of Lexical Phonology which procedurally interleaves word formation and phonological interpretation.[14] Interactionism violates the fundamental generative architecture of grammar where all concatenation precedes all interpretation (inverted T model). In times when Lexical Phonology was the standard model of phonology and could hardly be challenged as such, Halle & Vergnaud (1987) have already proposed a non-interactionist "version of Lexical Phonology", an enterprise that amounts at squaring the circle since it does Lexical Phonology without the lexicon. But anyway, the classical generative model has then found its modern incarnation in the skin of Distributed Morphology (Halle & Marantz 1993, Marantz 1997), which firmly rejects the lexicon and interactionism.

7.3. Direct Interface, SPE and Distributed Morphology

Direct Interface is something like the missing link between Distributed Morphology and phonology: the representations that Distributed Morphology builds (xPs) are located in morpho-syntax. In case they are spelled out by different phases, usually separation lines cut the morpho-syntactic tree into pieces, and arrows point into blank space. It is this blank space that Direct Interface fleshes out. For one thing, the small body of work devoted to phonology in Distributed Morphology (e.g. Marantz 1997, Marvin 2002) so far has not made explicit who takes the decisions for arrow-drawing, i.e. for spelling out this or that chunk as a phase of its own. Surely not morpho-syntax itself. Direct Interface thus explicitly installs a Translator's Office in modular no-man's land which makes this kind of decision. What I call chunk submission are the various phases, but looked at from below, i.e. from the position of the phonology.

Also, the phonologically relevant work in Distributed Morphology has so far tried to treat all phenomena with the only instrument provided by phase theory, that is (5)b. I believe that this is necessary, but not sufficient. Interface activity does not boil down to the phonological cycle: some representational device is also needed. Actually, this procedural-

[14] Interestingly, modern constraint-based versions of Lexical Phonology such as Bermúdez-Otero (forth) do not necessarily hold up interactionism, which shows that Stratal OT for example is more than just OTed Lexical Phonology.

representational dualism is but the basic interface architecture of SPE, where boundaries covered the representational part, while the phonological cycle managed procedural matters. I thus believe that SPE was basically right and just needs to be amended in one respect: the representational items that are shipped off to the phonology must not be diacritic.

On this count, then, phonology is stupid and boring: there is absolutely nothing fancy going on in the phonological module: no concatenation, no ordered application of processes, no reranking of constraints – just interpretation.[15] The only thing that phonology is able to do is to interpret whatever is stuck into its space. This may be compared to a chemical process that occurs when a piece of composite material is dipped into a chemical bath: based on the ingredients of the piece and the properties of the bath, a chemical reaction goes into effect which ennobles the original piece and makes it apt for its life in the real world. The architect of the ingredients of the piece, of its size and of the timing of its dipping is the Translator's Office. It cannot alter the pieces that come from the (morpho-syntactic) factory, but it may rearrange them, add some ingredients at given locations (morpheme and word boundaries), and it decides which piece is dipped into the bath, and how many times this repeated.

7.4. Not phonology, the Translator's Office is derivational: the OT debate is without object

In this perspective, the entire debate regarding derivationalism that has more or less monopolised the discussion in OT for more than a decade and is currently still ongoing appears as a waste of time, energy and ink. The reason for that is that OT, as many other theories, has not developed a clear vision of the interface. For in a modular environment where modules do not know about the existence of each other and a Translator's Office standing in modular no-man's land makes all relevant decisions regarding the interface, derivationalism, the public enemy number one in OT, is *not* a property of phonology. It is a property of the Translator's Office: this is where chunk submission (phase) is decided and managed. Phonology itself is entirely non-derivational: it is much too stupid in order to perform all the complicated things that Lexical Phonology and (derivational versions of) OT are asking her to do.

The contours of the very basic modular architecture, whose existence is a minimal requirement for any (generative) theory, are indeed blurred in OT, to say the least. Some authors offer radically misled solutions where modules simply cease to exist: Russell (1999) for example proposes that all syntactic, morphological and phonological constraints are scrambled in one single constraint ranking and assess candidates in parallel. But even less radical versions scramble many things: for example, the absence of any constraint on the formulation of constraints (in prose) has led to constraints that it will be difficult to call either phonological or morphological – they are both at the same time. In such an environment, then, it will be difficult to talk about Indirect Reference: it is simply unclear where the limits of the modules run. I doubt that anybody today is able to draw boxes like under (1), saying "this is phonology, and here is what exclusively belongs to it", "this is morpho-syntax, and this is what exclusively belongs to it". The de facto abandon of modularity in OT is sometimes made explicit in the literature as for example by Yip (1998) in the quotation below, but this does not seem to motivate OT practitioners to call for any change of perspective.

> "These results make it hard to identify a clear dividing line between morphology and phonology. What is more, they go much further to blur the distinction than does the interleaving of phonology and morphology found in lexical phonology. In lexical phonology, each component has its own character: the

[15] Rich and interesting phonology such as Stratal OT and DOT which accommodate the phonological cycle (in the form of reranking) are redundant: phase is needed in morph-syntax anyway, so why should there be a domestic phonological means to do the same job again?

> entities are different, and the rules are different. In Optimality Theory, this is not necessarily the case. Alignment is the most striking example. Alignment appears to play a role in pure morphology, in pure phonology, and at the interface." Yip (1998:219)

The specific issue that Yip addresses is indeed an interesting one: all versions of OT[16] have taken over the Prosodic Hierarchy from the 80s. In a constraint-based environment, then, mapping is done by two basic constraint families, ALIGN and WRAP (McCarthy & Prince 1993, Truckenbrodt 1999)[17]. These, however, are part of the single constraint ranking that is responsible for phonological matters and assesses candidates in parallel fashion. The conflict with modularity is timidly pointed out by Yip in the above quote: mapping could not possibly take place in the phonology; it is necessarily done in the Translator's Office. In other words, Prosodic Phonology has developed a perfectly sound division of labour in modular terms: mapping was done outside of the phonology, and the output of this operation, the Prosodic Hierarchy, was sent down into the phonological module (cf. (1)). OT then has taken over the output of this operation, but destroyed its modular architecture at the same time: the Translator's Office has been annexed by the phonology. This, however, is impossible if modularity makes any sense at all.

In sum, thus, OT seems to slowly move to a non-modular organisation of grammar. At any standards, this is certainly incompatible with the deepest layer of generative principles. And it artificially – actually almost wilfully – creates the illusion that phonology is derivational. Minimal modular framing shows that the phonological cycle can only be managed in the Translator's Office – phonology itself is stupid and perfectly non-derivational.

7.5. Restrictions on representational intervention

After this excursus into the more general theoretical landscape, let us return to the focus of this article: the representational intervention of morpho-syntax in phonology (5)a. It follows from the preceding discussion that its very essence is local: only objects that are adjacent to the morpho-syntactic boundary at hand can be targeted. Logically, this means for any given sequence of two morphemes (or words) which enclose a boundary that the Translator's Office may intervene on three different objects: 1) the last item of morpheme one, 2) the first item of morpheme two and 3) the empty space that lies between them.

It is true that the notions "last item" and "first item" may be interpreted in various ways, and that this depends on the particular phonological theory (since we are talking of phonological items). Under (7) and (8) below I adopt an all-purpose autosegmental representation that is as unmarked as possible and has good chances to be shared by all current theories. It should be kept in mind, however, that this is just for expository reasons, and that any specific content of a particular phonological theory may have its proper definition of "first and last item of a morpheme". Note, however, that – quite obviously – the minimal requirement for a representational intervention in phonology is the existence of domestic phonological representations. This looks like a trivial statement, but the status of representations is not clear at all in some versions of OT where computation is king and representations only decoration that cannot contribute any sovereign and unoutrankable arbitral award (see Scheer 2003, 2004:§309). On this count, then, I take the "first phonological item" of a morpheme to be its first syllabic constituent together with all melodic material that it dominates. The "last phonological item" has the symmetric definition.

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[16] Including Stratal OT which in the OT landscape tries to uphold modularity most cautiously: Bermúdez-Otero (forth:43ss) for example attempts at limiting the access of phonology to morpho-syntactic information to a minimum.

[17] As well as by other constraints that manage the internal properties of the Prosodic Hierarchy and information regarding focus, topic and eurythmy (Selkirk 1996,2000).

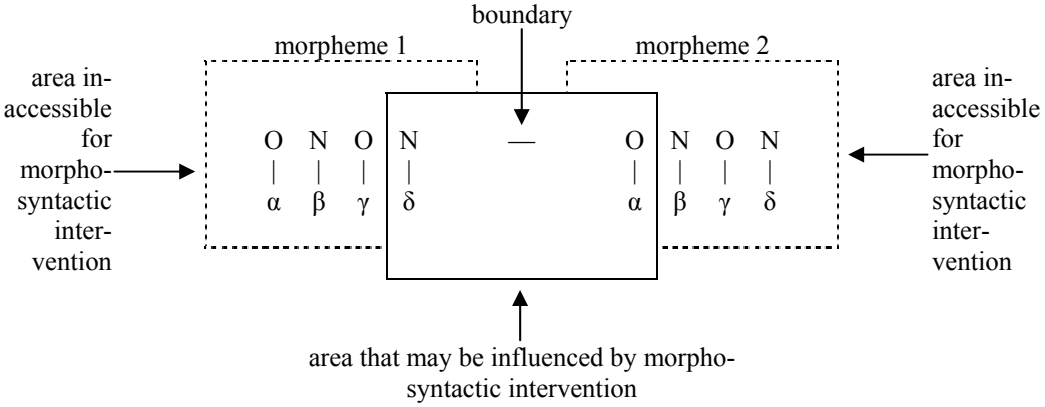
Behind this restriction, of course, is an observation that every phonologist has made: the kind of phonology that is observed at morpheme edges is quite different from the kind of phonology that is encountered in the middle of morphemes, and this seems to be a robust cross-linguistic generalisation (among many others, Rubach & Booij 1990, Broselow 2003). Moreover, the edge-interior asymmetry is not just of any kind: phonology is always "regular", "normal", "unmarked", "clean" in the middle of morphemes, while it is all the opposite at edges (but both edges do not introduce the same anomalies, cf. Scheer 2004:§§89ss,377). This precisely follows form the locality of higher intervention: phonology is "left alone" inside morphemes, but must compose with extra-phonological law at morpheme edges.[18]

(6) the edge-interior asymmetry is due to locality of higher intervention
   a. phonological law alone governs the phonological behaviour inside morphemes.
   b. both regular domestic phonological law and extra-phonological law (i.e. the representational output of the Translator's Office) determine the phonological behaviour of morpheme edges.
   In case of conflict, the extra-phonological law "wins".

That higher intervention at edges supersedes domestic phonological law in case of conflict is logically necessary: otherwise higher intervention would have no effect at all.

With all this borne in mind, the table under (7) fleshes out what locality means in a minimal representational environment: it delineates the zone where the output of the Translator's Office can come down on phonology in order to change its regular domestic course.

(7) higher level intervention is local: definition of its zone of influence I

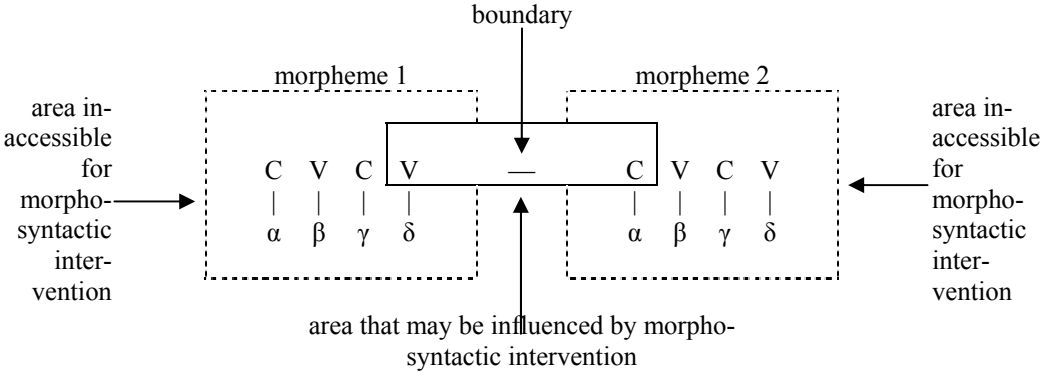


But this is not all: we already know from the brief discussion of phonology-free syntax in section 5.2 that nobody has ever seen any melodic property conditioning a morphological or a syntactic process. Recall that while there is debate whether phonological properties

[18] Structuralists badly abused boundaries in making them non-local: since juncture phonemes were supposed to be regular phonemes (which of course is as wrong as saying that they are [-segment] segments, the analogous take of SPE, something that Pyle 1972 has pointed out), they had to be able to be freely distributed over morphemes. Hence just as any other phoneme, # could appear right in the middle of a morpheme. This opportunity was then coupled with the strive towards economy (the fewer phonemes the better phonology) and has produced Harris' (1951:87) absurd analysis of German: final devoicing being active in this language, a /d/ in final position, that is before the phoneme /#/, comes out as [t]. If the sequence /d#/ thus appears as [t], there is no need for an independent phoneme /t/ anymore: a word like *Teil* [tajl] "piece" will be /d#ajl/. Hence grammar can do away with all voiceless phonemes, something that was considered a major descriptive advance. Juncture phonemes, which were thus regular phonemes but did not have anything to do with juncture anymore, were abused in this way for example by Trager (1962:19s) and Hill (1954). No present-day linguist would allow for this kind of absurd world where the phonological representative of morpho-syntactic divisions is completely estranged from any morpho-syntactic control. In other words, higher levels must not be able to govern into morpheme-internal phonology – they can only influence the phonology at morpheme edges.

located above the skeleton can bear on morpho-syntax, melody is definitely out of business. This is also true for conditioning in the opposite direction: nobody has ever seen a morpheme that normally ends in *-p*, but before a certain morpheme turns into, say, *-s*. In case melodic changes are encountered at morpheme breaks, phonologists always suppose the existence of a local melodic source, a floating palatal agent for example. On the other hand, phonotactic and suprasegmental effects are plethoric at the edge of morphemes: extrasyllabicity, extraprosodicity, the restriction of word-initial clusters to obstruent-sonorant sequences, the allowance for heavy clusters at the right edge (e.g. English *sixths* [sɪksθs]) are just a few examples. It is therefore perfectly reasonable and consensual to formally exclude the area below the skeleton from the possible target zone of higher level intervention: whatever the representational output of the Translator's Office, it can only land above the skeleton. The table under (8) identifies the area that is left for higher level intervention when both locality and melody restrictions are combined.

(8) higher level intervention is local: definition of its zone of influence II



We have now reached the end of the introduction to the general properties of Direct Interface. It is useful to recall that Direct Interface is theory-unspecific: any particular phonological theory can run in its frame. Different representational vocabulary germane to competing theories, then, will make different predictions as to the effects observed upon extra-phonological conditioning. This is a welcome effect since it allows to assess the comparative merit of phonological theories.[19]

8. Direct Interface in CVCV

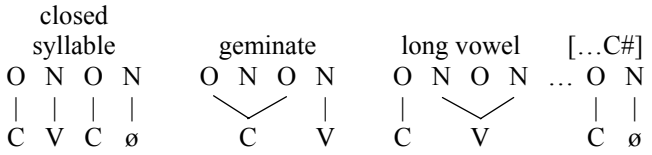
This section applies Direct Interface to a particular phonological theory, CVCV. Or rather, it opens a very small window on how CVCV works at the interface and what kind of prediction it makes. Although incomplete without this last step, the discussion of Prosodic Phonology and the introduction of Direct Interface is certainly big enough a programme for a single article. Space restrictions therefore only allow for a stenographic introduction of CVCV and the description of how its tools are used by Direct Interface. A more complete overview is in preparation (Scheer forth).

[19] I show in Scheer (forth) that this is not just lip-service: had the absurd consequences of SPE-type boundaries that have been pointed out by Pyle (1972) and Rotenberg (1978) for example been taken seriously, phonologists would have been forced to change the then current phonological theory. That is, the outlandish behaviour of # at the interface would have enforced the conclusion that segments, of which # was supposed to be a sub-species (# was a [-segment] segment), are not the adequate interface currency. In other words: there must be something else than just segments in phonology – (autosegmental) representations.

8.1. Background: CVCV

CVCV is an offspring of Government Phonology (Kaye et al. 1990, Harris 1994). The central idea of this theory is the lateralisation of structure and causality: instead of the familiar syllabic arborescence, lateral relations among constituents are responsible for the effects observed. CVCV takes this line of reasoning to its logical end: it holds that syllabic constituency boils down to a strict sequence of non-branching Onsets and non-branching Nuclei in all languages.[20] There are no Codas and no Rhymes, and the minimal syllabic unit that may be manipulated is an Onset followed by a Nucleus: the existence of the former implies the latter and *vice versa*. For the sake of clarity, the constituent structure of some basic phonological objects appears under (9) below.[21]

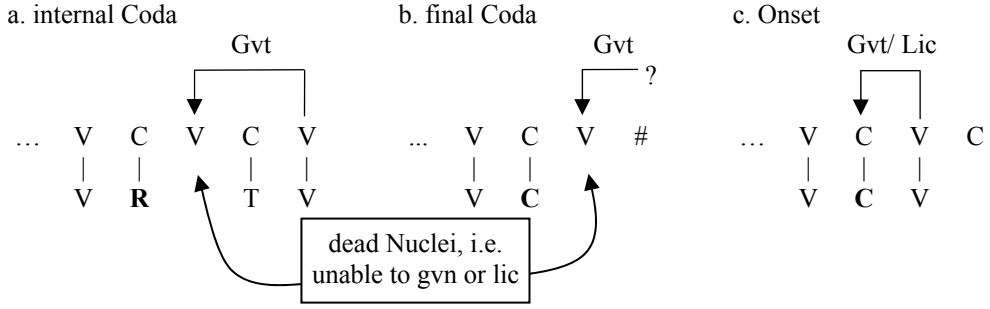
(9)



In traditional approaches, syllabic arborescence assures the function of binding together different constituents, thereby identifying their grouping into higher units. In the option shown under (9), this function is shifted onto lateral relations that are assumed to hold between constituents: Government and Licensing. Effects that are usually attributed to the fact that a given segment belongs to this or that syllabic constituent are claimed to stem from the configuration regarding Government and Licensing that it is involved in.

Let us illustrate this perspective by just one example, Coda phenomena (this is all that can be done in the frame of this article, more detailed discussion is available in Scheer 2004, Ségéral & Scheer 2001). Coda phenomena are effects that are triggered by Codas and either appear on the Coda itself (lenition, devoicing etc.) or on the preceding vowel, in which case they are usually called closed syllables effects (vowel shortening, nasalisation etc.). The former situation is depicted under (10) below.[22]

(10) the Coda in CVCV: a consonant that occurs before a governed empty Nucleus



In classical approaches, the Coda disjunction is reduced to a non-disjunctive statement by saying that consonants in word-final and pre-consonantal position belong to a specific constituent, the Coda. In CVCV, Coda consonants occur before a governed empty Nucleus

[20] CVCV has been proposed by Lowenstamm (1996); relevant references are, among others, Scheer (2004), Scheer & Szigetvári (2005), Szigetvári (1999), Cyran (2003).

[21] Obstruent-liquid sequences (i.e. branching Onsets) are left out of consideration here: space restrictions preclude their discussion (Scheer 2004:§14 and Ségéral & Scheer 2005 introduce the matter more carefully). On the following pages, T is shorthand for any obstruent, R for any sonorant.

[22] The question mark at the origin of the arrow under (10)b is a matter of higher level intervention, to be explained shortly.

(unlike Onset consonants, cf. (10)c).[23] The difference between both descriptively equivalent statements is the causal relation between the relevant environment and the observed phenomenon. We know that Codas are weak since their hosts are prone to all kinds of lenition. On the Coda account, however, this observation has no explanation: there is no reason why Codas, rather than Onsets, should be weak. By contrast, the fact that objects are weak before empty, rather than before contentful Nuclei, has an obvious explanation: empty Nuclei cannot support their Onset. In more formal terms, they cannot license.

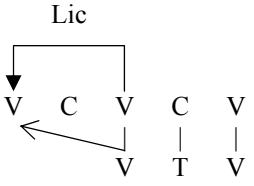
Licensing is thus a supportive force. Government, on the other hand, has opposite properties: it inhibits the segmental expression of its target, for example in vowel-zero alternations where the Nucleus cannot be vocalised in case it is governed. And in the representations under (10)a,b where the governed Nuclei do not host vowel-zero alternations. Finally, Licensing and Government are always regressive (head-final).

In CVCV, Licensing is thus responsible for Coda phenomena: since the Nucleus of the Coda consonants under (10)a,b is governed (and empty), it cannot dispense Licensing. Unlike under (10)c where the Nucleus of the Onset consonant hosts a full vowel and therefore can license. In Government Phonology indeed, it is a ground rule that only phonetically expressed Nuclei have lateral actorship, i.e. are able to govern and license. Therefore under (10)a,b the Coda consonant is unlicensed (and ungoverned), while the Onset consonant under (10)c is licensed (and governed; see the Coda Mirror, Ségéral & Scheer 2001,2005, on the interference of both lateral forces).

Coda effects visible on the Coda itself are thus due to Licensing. The same is true for their vocalic peers: looking back at (10), vowels in closed syllables, i.e. those preceding the boldfaced Coda consonants under (10)a,b, are followed by a governed empty Nucleus, while vowels in open syllables as under (10)c stand before a contentful Nucleus. Since governed empty Nuclei are unable to dispense any lateral force, the preceding Nucleus will be unlicensed (and ungoverend). In other words, Coda effects on Codas are due to (the absence of) Nucleus-to-Onset Licensing, while closed syllable effects stem from (the absence of) internuclear Licensing.

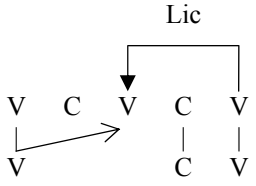
Finally, the functioning of long vowels in CVCV needs to be introduced before we can look at the interference of interface information. In some languages long vowels are always long no matter whether they stand in open or in closed syllables (e.g. German, Somali); in others, they shorten in closed syllables (or short vowels lengthen in open syllables, which comes down to the same), as e.g. in Turkish and Icelandic. In CVCV (Scheer 2004:§218), long vowels consist of a single chunk of melody which is associated to two Nuclei: one is the head, the other the complement. The head, however, can spread onto its complement only if this complement is licensed. As is shown under (11) below, stable long vowels are stable because they are head-final and hence "self-licensors": their complement is always licensed. Alternating long vowels, on the other hand, are left-headed, which means that their complement may or may not be licensed according to the situation on their right.

(11) a. non-alternating long vowel: head-initial, i.e. a self-licensor

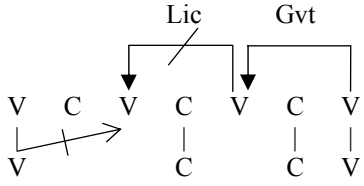


b. alternating long vowel: head-final, i.e. needs support from the right

in open syllable: complement licensed



in closed syllable: complement unlicensed



[23] Although there are no Codas in CVCV, I continue to use the familiar vocabulary for descriptive purposes.

In closed syllables, the complement of alternating long vowels thus remains unlicensed because it occurs before a governed empty Nucleus, which is unable to license. By contrast, the head melody may spread on its complement in open syllables because the latter occurs before a sound licensor.

8.2. Predictions made by CVCV regarding the interface

The previous section has illustrated the following properties of CVCV. First, syllable structure is entirely managed by Government and Licensing. Second, the minimal syllabic entity is a CV unit, i.e. an Onset followed by a Nucleus. Third, the first constituent of morphemes is always an Onset, while their last constituent is always a Nucleus. As a matter of fact, this very restrictive list exhausts the instruments that CVCV disposes of above the skeleton. That is, CVCV ambitions to account for all supra-skeletal phenomena (syllable structure, stress, see Scheer & Szigetvári 2005, extrasyllabicity and so forth) with just the CVCV structure, Government and Licensing.[24] And in addition, of course, the same set of restricted tools is all that can be used in order to manage the processing of interface information.

Now recall from section 7.5 that only units above the skeleton can be manipulated by higher level intervention. Therefore, a prediction is made to the effect that the Translator's Office can have four and only four outputs:[25]

(12) possible outputs of the Translator's Office in CVCV
  a. modification of the syllabic space: insertion of an empty CV unit
  b. manipulation of the lateral actorship of Nuclei
    1. make a final empty Nucleus (FEN) a good governor: "FEN, you are a good governor"
    2. make a final empty Nucleus (FEN) a good licensor: "FEN, you are a good licensor"
  c. make FEN governed: "FEN, you are governed"

By the same token, the following are non-events because of the inherent properties of CVCV: "FEN, you are licensed" and "first Onset, you are a good governor/ a good licensor". Indeed, there is no empirical effect associated with the fact that a FEN is licensed or not (while there is an effect of it being governed or not, to be discussed shortly). Also, only Nuclei are the source of Government and Licensing in CVCV; therefore the first Onset of a morpheme cannot be made a good governor or a good licensor.

The insertion of a CV unit as under (12)a may have various effects according to the context and the domestic phonological patterns at play. For example, if there is a general gemination process, the arrival of a CV unit allows this process to go into effect at the boundary where it is inserted. If on the other hand there is a hiatus-breaking epenthesis of a glide, the insertion of a CV in the middle of the hiatus blocks epenthesis because the two vowels that constitute the hiatus are not adjacent at the syllabic level anymore.[26] Yet on other occasions, an inserted CV may trigger epenthesis because it provides space: French consonants that appear at derivational boundaries such as in *numéro-**t**-er* "to number" are a case in point (Pagliano 2003). The best studied instance of this type of higher level intervention, however, is the equation "# = CV": the phonological identity of the beginning of

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[24] Also, melodic effects such as lenition are controlled by Government and Licensing alone (Ségéral & Scheer 2001, Scheer 2004). This advanced minimalism is an important argument in favour of CVCV.

[25] Marc van Oostendorp has pointed out to me that there is actually a fifth possibility: when ungoverned or unlicensed, initial Onsets may be made governed or licensed qua higher level intervention. The consequences of this additional possibility need to be computed.

[26] This is the case in French: compare suffix-created hiatuses like in /li-a/ → [lija] "to tie, past" with their prefix-created peers as in *anti-aloholique* [ãtialk..] where no glide may appear (e.g. Dell 1972).

the word is a CV unit in those languages that have the typical Indo-European restrictions on word-initial clusters (#TR-only) (Lowenstamm 1999, Scheer 2004:§102, Seigneur-Froli 2003, Scheer & Ségéral forth).

Let us now look at (12)c. As all other empty Nuclei, final empty Nuclei must have a reason to be empty: they need to be governed. Since they are final, however, there is nobody to their right that could provide Government. This is why they have simply been declared exceptional in Standard Government Phonology (Kaye 1990): they were said to be "parametrically licensed" – but it was never mentioned by whom. In fact, it follows from the general properties of CVCV (and actually of Standard Government Phonology) that FEN cannot be empty for domestic phonological reasons: the only possible origin of the Government that they are subject to is the Translator's Office. The parametric variation at hand concerns the ability for a language to have consonant-final words: some languages do (e.g. English), others do not (e.g. Italian). FENs of languages with consonant-final words are thus governed "by morphology", while higher modules leave phonology alone in languages like Italian where FEN, following purely domestic law, cannot exist.

When the Translator's Office overrides domestic phonological law and declares a FEN a good governor as under (12)b1, the language in question can not only have word-final consonants, but also word-final clusters (of falling and equal sonority: RT#, TT#, RR#). Clusters enclose an empty Nucleus which thus needs to be governed. In a word such as English *fact* /fækøtø/, then, two empty Nuclei in a row can only be well-formed if the latter is a good governor. Since of course it is not qua domestic phonological law (recall that only contentful Nuclei are lateral actors), it has acquired this licence through the intervention of the Translator's Office. On the other hand, higher levels leave phonology alone in languages where word-final clusters are excluded: domestic law assures that FEN cannot govern.

Of course, the two parametric choices mentioned may be crossed, opening a fourfold parametric space, of which one option is irrelevant: 1) languages with final consonants but without final clusters (FEN are governed, but cannot govern); 2) languages with final consonants and final clusters (FEN are governed and can govern), 3) languages that have neither final consonants nor final clusters (FEN are ungoverned and hence necessarily contentful, which means that they are able to govern anyway).

Finally, let us turn to the licensing abilities of final empty Nuclei. Qua domestic phonological law, FEN cannot license. If they receive this potential from the Translator's Office, the effect is twofold and necessarily twofold: 1) word-final consonants will cease to be Codas because they are now licensed (recall that Codas are unlicensed and ungoverned); 2) vowels in word-final closed syllables (i.e. those occurring before word-final consonants) cease to stand in a closed syllable since they are now licensed (recall that vowels in closed syllables are unlicensed and ungoverned). If a head-initial long vowel happens to occur in this position, it may be long because its complement will now be licensed.

In sum, thus, a binary parametric situation is predicted: in any given language, either final Codas (i.e. word-final consonants) behave like true Codas (i.e. are paired with internal Codas) *and* vowels in word-final closed syllables show regular closed-syllable behaviour, or final Codas do not behave like Codas (hence part company with internal Codas) *and* vowels in word-final closed syllables behave like if they stood in open syllables. This is precisely the pattern that is observed in natural language: there does not seem to be a language on record where final Codas behave like true Codas, but vowels in final closed syllables display open syllable behaviour; or where final Codas behave like non-Codas, while vowels in final closed syllables show closed syllable behaviour.

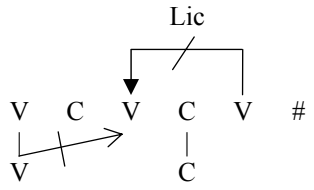
This pattern is usually expressed by the extrasyllabic status of word-final consonants, which seems to also do justice to the empirical record. In classical derivational approaches which are necessary for extrasyllabicity, however, it appears that this promise remains

unfulfilled: nothing enforces all phonological processes to apply before the adjunction of extrasyllabic consonants to some syllabic or prosodic constituent (in which case indeed extrasyllabic consonants would be invisible for *all* of the phonology). It may well be that the Coda-sensitive process applies before adjunction, whereas the closed syllable process goes into effect after adjunction (or vice-versa). In this case, the word-final consonant should be visible to the latter, but not to the former (or vice-versa), contra the empirical record (Scheer 2004:§364).

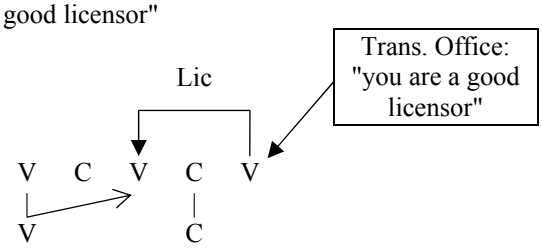
Regarding individual processes, the variation described for word-final consonants and word-final closed syllables is well known. For example, l-vocalisation (into [w]) occurs in both internal and final Codas in Brazilian Portuguese and Serbo-Croatian (although it is not productive anymore in the latter language), while it is only observed in internal Codas in Old French (e.g. Bourciez 1926:240ss, data are duly introduced in Scheer 2004:§§526,532). On the vocalic side, closed syllable shortening is observed either in both internal and final closed syllables (Turkish, Czech), or only in final closed syllables (Icelandic, e.g. Gussmann 2002:157ss, but again: for lack of space data cannot be discussed here). Table (13) below shows how the intervention of the Translator's Office alters the regular domestic course of phonology in Icelandic, but leaves undisturbed domestic Turkish and Czech phonology.

(13) languages with vs. without Closed Syllable Shortening in final closed syllables

Turkish *VVC#: domestic phonological law rules alone, no higher intervention



Icelandic VVC#: higher order "FEN, you are a good licensor"



Yet another massive cross-linguistic generalisation is predicted by Direct Interface: while the behaviour of final Codas and vowels in final closed syllables is variable, there is no variation word-internally. That is, internal Codas are always true Codas, and vowels in internal closed syllables show only closed syllable behaviour. In other words, languages where final Codas are true Codas while internal Codas do not behave like Codas do not appear to exist any more than languages where vowels in final closed syllables behave according to their label, whereas their peers in internal closed syllables act like if they stood in open syllables.

The non-existing patterns cannot be generated because morpheme-internally phonological law rules alone (section 7.5). It is only at morpheme edges that a binary variation is produced by the fact that higher levels may or may not intervene. In classical approaches, this generalisation is captured by extrasyllabicity and the so-called Peripherality Condition (see note 10) which stipulates that extra-X objects (extrasyllabic, extramoraic, extraprosodic, extrapedal etc.) can only occur at word-(morpheme-) edges. The difference between both solutions is that the latter has got nothing to do with the interface: for some unknown reason, extrasyllabicity occurs only at edges. By contrast in Direct Interface, the pattern follows directly from a property of the interface. It is quite obvious that the former scenario misses the point: edges of morphemes are special not because they are edges, but because they are the parts of morphemes that are adjacent to and influenced by boundaries – hence by extra-phonological information.

9. Conclusion

On the preceding pages, I have tried to present the theory of Direct Interface, and to show what happens when it is implemented in CVCV. Everything that has been said is at best incomplete: only one stream of generative interface thinking has been examined (Prosodic Phonology), some aspects of Direct Interface could not be addressed (e.g. privativity[27] and what I call the direct effect[28]), and its implementation into CVCV could only concern one of the four (or five) possible outlets of the Translator's Office.

Finally, current theories of the interface, which most of the time are constraint-based incarnations of Lexical Phonology or Prosodic Phonology (or both), could only be addressed superficially. But even on these grounds, it seems to me that a major problem arises from the fact that all versions of OT (as far as I can see) do mapping inside the phonology (section 7.4). This appears to be a harsh violation of the basic modular architecture of grammar: the Translator's Office necessarily stands in modular no-man's land; transferring it into the phonology blows up the phonological module. Also, it seems to me that the lack of precise modular contours in OT is at the origin of the misunderstanding regarding derivationalism, the single most heatedly debated issue in this theory: serialism is a property of the Translator's Office – phonology itself is entirely non-serial (section 7.4).

Everything that had to be left out here will only appear in volume two of Scheer (2004), of which this article is a piece. For the time being, though, I hope that the basic contours of Direct Interface could be presented, and that one argument has been made: the Prosodic Hierarchy is a diacritic, and diacritics have no place in linguistic theory. However, what I believe is the major point of this article is quite independent of whether or not it is agreed that the Prosodic Hierarchy is a diacritic. That is, I argue that following phonological thinking from the 19th century over structuralism and SPE, the correct interface currency are local boundaries, not autosegmental domains. The local potential of boundaries was thrown out with the diacritic bath in the early 80s. What we need is the discussion that has never taken place: is the action of the Translator's Office local or not? The new piece of evidence introduced by CVCV is the prove that a local *and* non-diacritic intervention of the Translator's Office is possible. If the preceding pages contribute to engage the debate regarding the locality of higher level intervention, they will have been worthwhile (writing and reading).

References

References that are available online are followed by

WEB1: www.unice.fr/dsl/tobias.htm, WEB2: seas3.elte.hu/szigetva/papers.html

WEB3: www.bermudez-otero.com

Bermúdez-Otero, Ricardo forth. Stratal Optimality Theory. Oxford: Oxford University Press. WEB3.

Booij, Geert 1983. Principles and parameters in Prosodic Phonology. Linguistics **21**, 249-280.

Booij, Geert 1985a. The Interaction of Phonology and Morphology in Prosodic Phonology. Phono-morphology. Studies in the Interaction of Phonology and Morphology, edited by Edmund Gussmann, 23-34. Lublin: Katolicki Universytet Lubelski.

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[27] Privativity holds that only those parts of morpho-syntactic information that are phonologically relevant are projected into the phonology, while non-privativity sends down a whole lot of unnecessary information. Chomsky et al. (1956), Kaye (1995) and Direct Interface are privative, while SPE and Prosodic Phonology are not. Bermúdez-Otero (forth:26ss) acknowledges two different ways of referring to morpho-syntactic structure: through classical Lexical Phonology levels and through the Prosodic Hierarchy. He argues that levels are a proper subset of morphological constituents (a principle he calls impoverishment), while the Prosodic Hierarchy is classically redundant.

[28] Unlike real phonological objects, diacritics do not make any prediction: anything and its reverse can happen at the beginning of an omega or after a #, while the presence of a CV unit makes precise predictions as to its effect (see Scheer 2004:§88).

Booij, Geert 1985b. Coordination reduction in complex words: a case for Prosodic Phonology. Advances in nonlinear phonology, edited by Harry van der Hulst & Norval Smith, 143-160. Dordrecht: Foris.
Booij, Geert 1986. Two cases of external sandhi in French: enchaînement and liaison. Sandhi Phenomena in the Languages of Europe, edited by Henning Andersen, 93-103. Berlin: Mouton de Gruyter.
Bourciez, Edouard 1926. Précis Historique de Phonétique Française. 6th edition Paris: Klincksieck.
Broselow, Ellen 2003. Marginal phonology: phonotactics at the edge. The Linguistic Review **20**, 159-193.
Chomsky, Noam & Morris Halle 1968. The Sound Pattern of English. Cambridge, Mass.: MIT Press.
Chomsky, Noam, Morris Halle & Fred Lukoff 1956. On Accent and Juncture in English. For Roman Jakobson. Essays on the occasion of his sixtieth birthday, edited by Morris Halle, Horace Lunt, Hugh McLean & Cornelis van Schooneveld, 65-80. The Hague: Mouton.
Clements, George 1990. The role of the sonority cycle in core syllabification. Papers in Laboratory Phonology I, edited by John Kingston & Mary Beckmann, 283-333. Cambridge: Cambridge University Press.
Condoravdi, Cleo 1990. Sandhi rules of Greek and Prosodic Phonology. The Phonology-Syntax Connection, edited by Sharon Inkelas & Draga Zec, 63-84. Chicago: University of Chicago Press.
Cowper, Elizabeth & Keren Rice 1987. Are phonosyntactic rules necessary? Phonology **4**, 185-194.
Cyran, Eugeniusz 2003. Complexity Scales and Licensing Strength in Phonology. Lublin: KUL.
Dell, François 1972. Une règle d'effacement de i en français. Recherches Linguistiques de Vincennes **1**, 63-88.
Dresher, Elan 1996. Introduction to Metrical and Prosodic Phonology. Signal to Syntax: Bootstrapping from Speech to Grammar in Early Acquisition, edited by James Morgan & Katherine Demuth, 41-54. Mahwah, NJ: Erlbaum.
Ghini, Mirco 1993. Phonological Phrase formation in Italian: a new proposal. Toronto Working Papers in Linguistics 12, 41-77.
Gussmann, Edmund 2002. Phonology: Analysis and Theory. Cambridge: Cambridge University Press.
Halle, Morris & William Isardi 1997. r, Hypercorrection and the Elsewhere Condition. Derivations and Constraints in Phonology, edited by Iggy Roca, 331-348. Oxford: Clarendon.
Halle, Morris & Alec Marantz 1993. Distributed Morphology and the Pieces of Inflexion. The view from Building 20. Essays in Linguistics in Honor of Sylvain Bromberger, edited by Kenneth Hale & Samuel Keyser, 111-176. Cambridge, Mass: MIT Press.
Halle, Morris & Jean-Roger Vergnaud 1987. An Essay on Stress. Cambridge, Mass.: MIT Press.
Harris, John 1994. English sound structure. Oxford: Blackwell.
Harris, Zellig 1951. Methods in Structural Linguistics. Edition 1960 entitled Structural Linguistics. Chicago & London: University of Chicago Press.
Hayes, Bruce 1984. The phonology of rhythm in English. Linguistic Inquiry **15**, 33-74.
Hayes, Bruce 1995. Metrical Stress Theory. Principles and Case Studies. Chicago, London: University of Chicago Press.
Hayes, Bruce 1989 [1984]. The Prosodic Hierarchy in Meter. Rhythm and Meter, edited by Paul Kiparsky & G. Youmans, 201-260. Orlando, Florida: Academic Press.
Hill, Archibald 1954. Juncture and syllable division in Latin. Language **30**, 439-447.
Hyman, Larry, Francis Katamba & Livingstone Walusimbi 1987. Luganda and the strict layer hypothesis. Phonology Yearbook **4**, 87-108.
Inkelas, Sharon 1990. Prosodic Constituency in the Lexicon. New York: Garland.
Inkelas, Sharon & Draga Zec 1990. Prosodically constrained syntax. The Phonology-Syntax Connection, edited by Sharon Inkelas & Draga Zec, 365-378. Chicago: Chicago University Press.
Inkelas, Sharon & Draga Zec 1995. Syntax-phonology Interface. The Handbook of Phonological Theory, edited by John Goldsmith, 535-549. Oxford: Blackwell.
Jackendoff, Ray 1992. Languages of the mind. Cambridge, Mass.: MIT Press.
Jackendoff, Ray 1997. The Architecture of the Language Faculty. Cambridge, Massachusetts: MIT Press.
Kaisse, Ellen 1983. The syntax of auxiliary reduction in English. Language **59**, 93-122.
Kaisse, Ellen 1985. Connected Speech. The interaction of Syntax and Phonology. London, New York: Academic Press.
Kaisse, Ellen 1990. Toward a Typology of Postlexical Rules. The Phonology-Syntax Connection, edited by Sharon Inkelas & Draga Zec, 127-143. Chicago: Chicago University Press.
Kaye, Jonathan 1990. 'Coda' licensing. Phonology **7**, 301-330. WEB1.
Kaye, Jonathan 1995. Derivations and Interfaces. Frontiers of Phonology, edited by Jacques Durand & Francis Katamba, 289-332. London & New York: Longman. Also in SOAS Working Papers in Linguistics and Phonetics **3**, 1993, 90-126. WEB1.
Kaye, Jonathan, Jean Lowenstamm & Jean-Roger Vergnaud 1990. Constituent structure and government in phonology. Phonology **7**, 193-231. WEB1.
Kiparsky, Paul 2000. Opacity and cyclicity. The Linguistic Review **17**, 351-365.

Langendoen, Terence 1975. Finite state parsing of phrase structure languages and the status of readjustment rules in the grammar. Linguistic Inquiry **6**, 533-554.
Liberman, Mark 1975. The Intonational System of English. Ph.D dissertation, MIT.
Liberman, Mark & Alan Prince 1977. On Stress and Linguistic Rhythm. Linguistic Inquiry **8**, 249-336.
Lowenstamm, Jean 1996. CV as the only syllable type. Current trends in Phonology. Models and Methods, edited by Jacques Durand & Bernard Laks, 419-441. Salford, Manchester: ESRI. WEB1.
Lowenstamm, Jean 1999. The beginning of the word. Phonologica 1996, edited by John Rennison & Klaus Kühnhammer, 153-166. La Hague: Holland Academic Graphics. WEB1.
Marantz, Alec 1997. No escape from syntax: don't try morphological analysis in the privacy of your own lexicon. University of Pennsylvania Working Papers in Linguistics **4.2**, 201-225.
Marvin, Tatjana 2002. Topics in the Stress and Syntax of Words. Ph.D dissertation, MIT.
McCarthy, John & Alan Prince 1993. Generalized Alignment. Yearbook of Morphology 1993, edited by Geert Booij & Jaap van Marle, 79-153. Dordrecht: Kluwer. Abridged version in McCarthy, John (ed.) 2004. Optimality Theory in Phonology, 451-463. Oxford: Blackwell.
McCawley, James 1968. The Phonological Component of a Grammar of Japanese. The Hague: Mouton.
Miller, Philip, Geoffrey Pullum & Arnold Zwicky 1997. The Principle of Phonology-Free Syntax: four apparent counterexamples in French. Journal of Linguistics **33**, 67-90.
Napoli, Donna Jo & Marina Nespor 1979. The syntax of word-initial consonant gemination in Italian. Language **55**, 812-841.
Neijt, Anneke 1985. Clitics in arboreal phonology. Advances in nonlinear phonology, edited by Harry van der Hulst & Norval Smith, 179-192. Dordrecht: Foris.
Nespor, Marina 1985. The phonological word in Italian. Advances in Nonlinear Phonology, edited by Harry van der Hulst & Norval Smith, 193-204. Dordrecht: Foris.
Nespor, Marina 1986. The phonological word in Greek and Italian. Sandhi Phenomena in the Languages of Europe, edited by Henning Andersen, 65-74. Berlin: Mouton de Gruyter.
Nespor, Marina, Theresa Guasti & Anne Christophe 1996. Selecting word order: the Rhythmic Activation Principle. Interfaces in Phonology, edited by Ursula Kleinhenz, 1-26. Berlin: Akademie Verlag.
Nespor, Marina & Irene Vogel 1979. Clash Avoidance in Italian. Linguistic Inquiry **10**, 467-482.
Nespor, Marina & Irene Vogel 1982. Prosodic domains of external sandhi rules. The Structure of Phonological Representations, Part I, edited by Harry van der Hulst & Norval Smith, 225-255. Dordrecht: Foris.
Nespor, Marina & Irene Vogel 1983. Prosodic structure above the word. Prosody: Models and Measurements, edited by Anne Cutler & Robert Ladd, 123-140. Berlin: Springer.
Nespor, Marina & Irene Vogel 1986. Prosodic Phonology. Dordrecht: Foris.
Pagliano, Claudine 2003. L'épenthèse consonantique en français. Ce que la syntaxe, la sémantique et la morphologie peuvent faire à la phonologie. Ph.D dissertation, Université de Nice.
Prince, Alan 1983. Relating to the Grid. Linguistic Inquiry **14**, 19-100.
Pyle, Charles 1972. On Eliminating BM's. Papers from the eighth regional meeting of the Chicago Linguistic Society, edited by Paul Peranteau, Judith Levi & Gloria Phares, 516-532. Chicago: Chicago Linguistic Society.
Rice, Keren 1987. On defining the intonational phrase: evidence from Slave. Phonology Yearbook **4**, 37-59.
Rotenberg, Joel 1978. The Syntax of Phonology. Ph.D dissertation, MIT.
Rubach, Jerzy 1997. Extrasyllabic Consonants in Polish: Derivational Optimality Theory. Derivations and Constraints in Phonology, edited by Iggy Roca, 551-581. Oxford: Clarendon.
Rubach, Jerzy & Geert Booij 1990. Edge of constituent effects in Polish. Natural Language and Linguistic Theory **8**, 427-463.
Russell, Kevin 1999. MOT: sketch of an OT approach to morphology. Ms., University of Manitoba.
Sandalo, Filomena & Hubert Truckenbrodt 2002. Some notes on phonological phrasing in Brazilian Portuguese. MIT Worling Papers in Linguistics **42**, 285-310.
Scheer, Tobias 2003. Structure and Process: Computation is not King. Paper presented at the conference From representations to constraints and from constraints to representations, Toulouse 9-11 July 2003. WEB1.
Scheer, Tobias 2004. A Lateral Theory of Phonology. Vol.1: What is CVCV, and why should it be? Berlin: Mouton de Gruyter.
Scheer, Tobias forth. A Lateral Theory of Phonology. Vol.2: On Locality, Morphology and Phonology in Phonology. Berlin: Mouton de Gruyter.
Scheer, Tobias in press. Syllabic and trapped consonants in (Western) Slavic: different but still the same. Investigations into Formal Slavic Linguistics, edited by Gerhild Zybatow & Luka Szucsich. Frankfurt am Main: Lang. WEB1.
Scheer, Tobias & Philippe Ségéral forth. The Coda Mirror completed. Lenition and Fortition, edited by Joaquim Brandão de Carvalho, Tobias Scheer & Philippe Ségéral. Berlin: Mouton de Gruyter.
Scheer, Tobias & Péter Szigetvári 2005. Unified representations for the syllable and stress. Phonology **22**, 37-75.

Ségéral, Philippe & Tobias Scheer 2001. La Coda-Miroir. Bulletin de la Société de Linguistique de Paris **96**, 107-152. WEB1. Earlier English version available at WEB1.

Ségéral, Philippe & Tobias Scheer 2005. What lenition and fortition tells us about Gallo-Romance *Muta cum Liquida*. Romance Languages and Linguistic Theory 2003, edited by Twan Geerts, Ivo van Ginneken & Haike Jacobs, 235-267. Amsterdam: Benjamins.

Seigneur-Froli, Delphine 2003. Diachronic consonant lenition & exotic word-initial clusters in Greek: a unified account. Studies in Greek Linguistics. Proceedings of the 23nd annual meeting of the department of linguistics, edited by M. Stavrou-Sifaki & A. Fliatouras, 345-357. Thessaloniki: University of Thessaloniki. WEB1.

Selkirk, Elisabeth 1972. The phrase phonology of English and French. Ph.D. dissertation MIT, published 1980 by Garland Press.

Selkirk, Elisabeth 1978. The French foot: on the status of "mute" e. Studies in French Linguistics **1**, 141-150.

Selkirk, Elisabeth 1980a. Prosodic Domains in Phonology: Sanskrit Revisited. Juncture, edited by Mark Aronoff & Mary-Louise Kean, 107-129. Saratoga: Anma Libri.

Selkirk, Elisabeth 1980b. The Role of Prosodic Categories in English Word Stress. Linguistic Inquiry **11**, 563-605.

Selkirk, Elisabeth 1981a [1978]. On prosodic structure and its relation to syntactic structure. Nordic Prosody II, edited by Thorstein Fretheim, 111-140. Trondheim: TAPIR.

Selkirk, Elisabeth 1981b. On the nature of phonological representation. The cognitive representation of speech, edited by J. Anderson, J. Laver & T. Meyers, 379-388. Amsterdam: North Holland.

Selkirk, Elisabeth 1984. Phonology and Syntax: The Relation between Sound and Structure. Cambrdige, Mass.: MIT Press.

Selkirk, Elisabeth 1986. On derived domains in sentence phonology. Phonology **3**, 371-405.

Selkirk, Elisabeth 1996. The prosodic structure of function words. Signal to syntax: bootstrapping from syntax to grammar in early acquisition, edited by James Morgan & Katherine Demuth, 187-213. Mahwah, NJ: Erlbaum.

Selkirk, Elisabeth 2000. The interaction of constraints on prosodic phrasing. Prosody: Theory and Experiments, edited by Merle Horne, 231-261. Dordrecht: Kluwer.

Szendröi, Kriszta 2003. A stress-based approach to the syntax of Hungarian focus. The Linguistic Review **20**, 37-78.

Szigetvári, Péter 1999. VC Phonology: a theory of consonant lenition and phonotactics. Ph.D dissertation. Eötvös Loránd University, Budapest. WEB2.

Szpyra, Jolanta 1989. The Phonology - Morphology Interface. London & New York: Routledge.

Trager, George 1962. Some Thoughts on 'Juncture'. Studies in Linguistics **16**, 11-22.

Truckenbrodt, Hubert 1999. On the Relation between Syntactic Phrases and Phonological Phrases. Linguistic Inquiry **30**, 219-255.

Vogel, Irene 1982. La sillaba come unità fonologica. Bologna: Zanichelli.

Vogel, Irene 1985. On constraining prosodic rules. Advances in nonlinear phonology, edited by Harry van der Hulst & Norval Smith, 217-233. Dordrecht: Foris.

Vogel, Irene 1986. External sandhi rules operating between sentences. Sandhi Phenomena in the Languages of Europe, edited by Henning Andersen, 55-64. Berlin: Mouton de Gruyter.

Vogel, Irene 1988. Prosodic constituents in Hungarian. Certamen Phonologicum, edited by Pier Marco Bertinetto & Michele Loporcaro, 231-250. Torino: Rosenberg & Sellier.

Vogel, Irene & István Kenesei 1987. The interface between phonology and other components of grammar: the case of Hungarian. Phonology Yearbook **4**, 243-263.

Vogel, Irene & István Kenesei 1990. Syntax and semantics in phonology. The Phonology-Syntax Connection, edited by Sharon Inkelas & Draga Zec, 339-363. Chicago: University of Chicago Press.

Yip, Moira 1998. Identity Avoidance in Phonology and Morphology. Morphology and its Relation to Phonology and Syntax, edited by Steven Lapointe, Diane Brentari & Patrick Farrell, 216-246. Stanford: CSLI Publications.

Zwicky, Arnold & Geoffrey Pullum 1986. The Principle of Phonology-free Syntax: introductory remarks. Ohio State University Working Papers in Linguistics **32**, 63-91.