

this handout and some of the references quoted at  
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## DIRECT INTERFACE

### REPRESENTATIONAL COMMUNICATION WITH PHONOLOGY

[Scheer 2012a]

<b>DAY 1</b> .....	<b>2</b>
1. What representational communication with phonology is about .....	2
2. Direct Interface .....	3
3. Direct Interface in the broader architecture of grammar .....	4
4. Arguments to be made .....	6
<b>DAY 2</b> .....	<b>8</b>
5. The Prosodic Hierarchy is a diacritic .....	8
6. Output of translation: domains are out of business .....	10
7. Other violations of modularity .....	12
<b>DAY 3</b> .....	<b>13</b>
8. Chunk definition in phonology .....	13
8.1. Competitors .....	13
8.2. History .....	13
8.3. Prosodic units are manoeuvring themselves into offside .....	14
8.4. Modular PIC .....	15
<b>DAY 4</b> .....	<b>19</b>
9. Real stuff vs. sleepers: the Direct Effect .....	19
10. Interface effects are not random: the beginning of the word .....	20
11. What the initial CV is initial of .....	22
11.1. Belarusian i-prothesis .....	22
11.2. Autonomous chunks .....	22
11.3. Syntactic phases and their phonological traces .....	24
<b>DAY 5</b> .....	<b>25</b>
Play ppt on Hebrew .....	25
<b>References</b> .....	<b>25</b>

## DAY 1

### 1. What representational communication with phonology is about

- (1) What representational communication with phonology is about
  - a. the 5 issues below are the backbone of what representational communication with phonology is about.
  - b. the representational side of the interface may actually reduce to these five questions.
  
- (2) #1  
 major issues for representational communication with phonology  
**modularity and its consequence, translation**  
 [is there any translation at all?]  
 are morpho-syntax and phonology distinct computational systems whose input are distinct sets of vocabulary items? If so, in order to be able to communicate at all, the output of morpho-syntactic computation needs to be translated into phonological vocabulary before phonological computation can proceed.
  
- (3) #2  
 major issues for representational communication with phonology  
**chunk definition: procedural or representational?**  
 [is translation responsible for chunk definition?]  
 everybody agrees that the linear string is cut into a number of chunks that are phonologically relevant in the sense that they limit the application of phonological processes (which are blocked by chunk boundaries). The question is whether the definition of these chunks is done procedurally (by cyclic derivation, today called phase theory) or representationally (by prosodic constituents, i.e. the output of translation).
  
- (4) #3  
 major issues for representational communication with phonology  
**(non-)privativity of translation**  
 [what exactly is translated?]  
 it is an observational fact that phonology is underdetermined by morpho-syntactic information: only some pieces thereof impact phonology. That is, most of morpho-syntactic information is entirely transparent to phonology. The question is thus whether only phonologically relevant information should be translated, or whether everything, including irrelevant noise, should be shipped to the phonology.
  
- (5) #4  
 major issues for representational communication with phonology  
**the diacritic issue**  
 [what does the output of translation look like?]  
 what kind of objects are inserted into the phonological string? Could this be any kind of object, i.e. diacritics such as #, or are there restrictions? Given modularity and domain specificity, diacritics do not qualify: only genuine members of the specifically phonological vocabulary can be carriers of morpho-syntactic information.

- (6) #5  
 major issues for representational communication with phonology  
**local vs. non-local insertion**  
 [how exactly is the output of translation inserted into the linear string?]  
 how exactly do carriers of (non-morphemic) morpho-syntactic information intervene in phonology? Locally (i.e. as a piece in the linear string that is located between two morphemes) or not (i.e. in form of autosegmental domains that cannot be localised in the linear string)?

## 2. Direct Interface

- (7) Question 1  
 Is there any translation at all?  
 Yes. The mind is modular, and so is language. Morpho-syntax and phonology are distinct modules that work with distinct domain-specific vocabulary. Hence any communication requires translation: carriers of morpho-syntactic information are the output of translation.
- (8) Question 2  
 Is translation responsible for chunk definition?  
 a. No. The chunks that are submitted to phonological computation are defined procedurally by cyclic (inside-out) derivation. Cyclic derivation is needed anyway, whether in the form of modern phase theory or in some other guise, and the chunking labour must not be done twice. Hence there is no place for a representational device that in addition to phase theory defines chunks.  
 b. An important condition for this perspective to be workable is selective spell-out on the procedural side, i.e. the idea introduced by Halle & Vergnaud (1987) that only a subset of morpho-syntactic nodes, today called phase heads, constitute a spell-out domain. Selective spell-out and its modern incarnation in phase theory is discussed at greater length in Scheer (2011: §§763, 771).
- (9) Question 3  
 What exactly is translated?  
 a. Only phonologically relevant morpho-syntactic information is translated. Morpho-syntactic properties that have no phonological effect are not translated. Translation serves a purpose: it flags some morpho-syntactic property in the signal. What exactly is flagged and why is a different question that linguists are unable to answer: this is what is called the mapping puzzle in Scheer (2011: §753).  
 b. The functional and perception-oriented perspective on morpho-syntactic traces in phonology, and ultimately in the phonetic signal, goes back at least to Trubetzkoy's Grenzsignale and has a host of modern incarnations (Scheer 2011: §264). That is, morpho-syntactic flags help the listener to identify morpho-syntactically relevant chunks, thus enhance the identification of lexical items and the access to meaning via a look-up in the mental lexicon. Kaye (1989) even argues that providing parsing cues is a reason why phonology as such exists in the first place, i.e. why there is any variation of sound in the linear chain that represents morphemes at all (a morpheme could as well be always pronounced in the same way no matter what the context) (Scheer 2011: §262).

- (10) Question 4  
 What does the output of translation look like?  
 a. The output of translation is a piece of the domain-specific vocabulary that is used in the phonological computational system. How this vocabulary is identified is shown in (27) below. Beyond this restriction that is commanded by modularity, an empirical generalisation further shrinks the set of possible carriers of morpho-syntactic information in phonology: melody does not qualify.  
 b. these combined restrictions shrink the window of possible carriers to just **syllabic space**.  
 c. The discussion has also, and actually foremost, determined which objects do *not* qualify for the output of translation:  
 1. diacritics and  
 2. (autosegmental) domains.  
 The former include all objects that previous interface theories have used for the representation of morpho-syntactic information in phonology: juncture phonemes, hash marks and prosodic constituency.
- (11) Question 5  
 How exactly is the output of translation inserted into the linear string?  
 a. Insertion of the carriers of morpho-syntactic information into the linear string of morphemes is  
 1. linear and  
 2. local  
 b. This means that objects which represent non-morphemic information in phonology have a left and a right neighbour, and these neighbours are morphemes: insertion can only occur at morpheme breaks (there is no insertion in the middle of morphemes). Local insertion at morpheme breaks is discussed at greater length below.
- ### 3. Direct Interface in the broader architecture of grammar
- (12) so why is Direct Interface direct?  
 a. because it eliminates the buffer (or sponge)  
 ==> no specific interface objects exist between morpho-syntax and phonology  
 ==> no #s, ω's, φ's, bananas or apples  
 b. the output of translation are only truly phonological objects, i.e. ones that exist in phonology independently of any interface activity.
- (13) Direct Interface is a theory of the interface, NOT of phonology  
 a. DI is about interface design, not the design of phonological theories.  
 b. It prohibits the use of diacritics in phonological theories, but is otherwise neutral: other properties of particular phonological theories remain uncommented.  
 c. Or, in other words, Direct Interface follows the minimalist idea to shape linguistic theories according to the properties of the interface that they are exposed to.  
 ==> individual phonological theories are refereed by the interface.

- (14) No uniform interface vocabulary
  - a. the properties of competing phonological theories may only be impacted precisely because there is no difference between regular phonological vocabulary and interface vocabulary.
  - b. That is, different phonological theories have different vocabulary and promote different representational objects – in the perspective of Direct Interface, they thus make different predictions as to what is a possible output of translation.
  - c. This output, in turn, defines in which way morpho-syntax influences phonology.
  - d. This means that in the end the **idiosyncratic vocabulary** of individual phonological theories defines what a possible interface event is (at least as far as the representational side of the interface is concerned).
  - e. a uniform interface vocabulary (#,ø's, φ's, bananas or apples) evens out differences of individual phonological theories, which may be different in phonology, but are all IDENTICAL at the interface.  
=> no way to ever have them refereed by interface events.
  
- (15) deforestation  
[Scheer 2011:§42, 2012a :§9]
  - a. Direct Interface eliminates arboreal structure: the Prosodic Hierarchy  
=> last piece of arboreal structure left.
  - b. CVCV is a LATERAL project  
=> non-arboreal way of expressing hierarchy in phonological structure  
[Lowenstamm 1996, Scheer 2004, Szigetvári 1999, Szigetvári & Scheer 2005, Cyran 2010]  
=> lateralization of structure and causality (Scheer 2004:§166)  
example:  
coda = **sister** of the nucleus  
vs.  
coda = **followed** by a governed empty nucleus
  - c. well-known and fundamental difference between morpho-syntax and phonology:
    - 1. there is no recursion in phonology
    - 2. there is no concatenation in phonology (or semantics for that matter)
 => hence there is no tree-building device in phonology
  
- (16) no trees in phonology
  - a. Neeleman & van de Koot (2006)  
trees have certain formal properties that make predictions regarding the type of phenomena that should be found in a tree-bearing environment.
  - b. These include
    - 1. projection
    - 2. long-distance dependencies
    - 3. and recursion.
  - c. The authors show that phonological phenomena do not display any of these properties. Therefore, they conclude that the presence of trees in phonology overgenerates: arboreal structure predicts things that are absent from the record.

- (17) consequences of concatenation and linearity  
#1  
Scheer (2004:§§2, 802ff, 2013)
  - a. complementary distribution
    - 1. syntax concatenates but has no linearity
    - 2. phonology does not concatenate but has linearity
  - b. if phonology is flat  
(i.e. does not have any tree-building mechanism), the absence of recursion is predicted:
    - 1. recursion is the consequence of concatenation  
=> no concatenation, no recursion.
    - 2. trees are the consequence of concatenation  
=> no concatenation, no trees
    - 3. recursion supposes trees:  
=> no trees, no recursion
  - e. there couldn't be a tree-based interface in the lateral perspective of phonology.
  
- (18) consequences of concatenation and linearity  
#2
  - a. why are there different ways in grammar to express hierarchy?
    - 1. trees
    - 2. lateral relations
  - b. why are they distributed as they are?
    - 1. syntax has trees (rather than lateral relations)
    - 2. phonology has lateral relations (rather than trees)
  - c. answer  
because of different design properties and different environmental conditions
    - 1. concatenation (design property of syntax)  
trees are the result of the fact that syntactic computation is meant to concatenate.  
There is no grammar in absence of concatenation.
    - 2. linearity (environmental condition)
      - There are no trees in phonology because phonology does not concatenate anything.
      - lateral relations are the product of linearity  
[demonstration to be made]
      - there are no lateral relations in syntax because they suppose linearity.
  
- 4. Arguments to be made**
  
- (19) the Prosodic Hierarchy is a diacritic  
=> diacritics are outlawed by modularity: domain specificity
  
- (20) output of translation  
linear and local (boundaries) vs. domain-based (prosodic constituents):  
the diacritic character of prosodic constituents is a necessary consequence of the fact that they are domains, rather than linear and local items.  
=> only boundaries can be non-diacritic (sic)  
=> the only possible interface currency are non-diacritic boundaries (sic)

- (21) aside from its diacritic character, the Prosodic Hierarchy cumulates violations of what was identified as a correct interface design.
  - a. For one thing, it is a non-privative means of doing translation: (almost) everything is shipped to the phonology, including irrelevant noise (question 3).
  - b. Also, it defines chunks and thereby replicates the job of cyclic derivation in times where spell-out is selective (question 2, this is the line of attack of Pak 2008 and Samuels 2009a).
  - c. The adaptation of the Prosodic Hierarchy to the constraint-based environment of OT has produced constraint-based mapping, which transfers translation *into* the phonology and thereby destroys the original modular architecture of Prosodic Phonology: translation is necessarily done in modular no-man's land.
  - d. Finally, another point that is unrelated to interface design should be enough to disqualify prosodic constituents: they are the projection of nothing. The (higher layers of the) Prosodic Hierarchy would be only arboreal structure in linguistics whereby the nodes are not projected from terminals, and do not represent any of their properties.
- (22) chunk definition: the Prosodic Hierarchy is redundant  
=> see section 8 below.
- (23) the Direct Effect  
diacritic sleepers vs. phonologically meaningful objects
  - a. diacritics do not make any prediction
    - 1. Phonology does not react on the simple presence of a hash mark or a prosodic word – such items can only bear on phonology if the analyst has made a phonological process sensitive to them.
    - 2. Hash marks, omegas and the like are **colourless** and may thus be described as passive **sleepers**.
    - 3. They merely sit in phonological representations without producing any effect by themselves: nothing happens unless a phonological instruction makes reference to them.
    - 4. The effect, then, is due to the instruction, not to the object itself.
  - b. but language does not work like that: effects, say, at the left edge of words are NOT random.
- (24) show
  - a. how a non-diacritic alternative works
  - b. what it can do
  - c. the only possible output of translation is syllabic space.  
Pending on your favourite theory:
    - 1. x-slots
    - 2. moras
    - 3. other syllabic constituents (onsets, rhymes, nuclei)
    - 4. CV units
  - d. three for one in CVCV:  
the initial CV predicts the convergent behaviour at the left edge of the word:
    - 1. #TR-only (or anything-goes, but no #RT-only)
    - 2. forced stability of the first vowel (or instability, but no forced instability)
    - 3. initial C strong (or not, but no forced initial weakness)

## DAY 2

### 5. The Prosodic Hierarchy is a diacritic

- (25) Prosodic Phonology lays claim to boundaries: they are the old buffer, prosodic domains are the modern buffer
  - a. In an overview article that anchors the legitimacy of Prosodic Phonology (with respect to Direct Syntax), Vogel & Kenesei (1990:344) review the arguments in favour of Indirect Reference. One point they make is historical: all interface theories have been indirect thus far, so there is probably something to this approach. They single out SPE as a forerunner of Indirect Reference.
  - b. "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)
  - c. Representatives of Prosodic Phonology thus lay claim to the equivalence of #s and the modern prosodic constituency.
  - d. The same line of reasoning is found in another overview article by Inkelas & Zec (1995). The authors call p-structure the level of representation that mediates between morpho-syntax and phonology; they explicitly identify boundaries as the ancestor of this mediating structure, whose more recent incarnation is the Prosodic Hierarchy.
  - e. "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 (1995:537f)
- (26) prosodic units are autosegmentalized hash-marks
  - a. 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.
  - b. The two quotes clearly show that prosodic constituency, just as hash marks, is a diacritic: it serves no other purpose than replicating phonologically relevant morpho-syntactic information in phonology.
  - c. This is the essence of diacritic translation, which is based on a buffer (or a sponge): phonologically relevant information is stored into a diacritic, which is transported into phonology where its load is released.
  - d. We have seen that this is true for the original implementation of the Prosodic Hierarchy where translation was rule-based, as much as for the OTed version thereof, constraint-based mapping.
- (27) a diacritic is an alien
  - a. A formal definition of what exactly counts as a diacritic must rely on the alien status of the object in question in the environment where it evolves. A workable definition appears below.

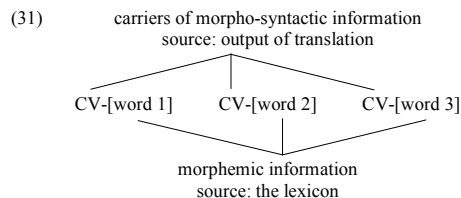
- b. definition of the term "diacritic"  
 a diacritic is a non-native object in module X: it is only used when information from outside of X is processed. It is absent from events that do not appeal to extra-Xal information.
- (28) Hash marks and omegas (i.e. prosodic words) alike meet these conditions
- they are non-phonological intruders in the phonological world which are injected for the *exclusive* purpose of storing extra-phonological information.
  - Also, they are systematically absent from phonological processes that do not use extra-phonological information. For example, an ordinary palatalisation that turns k into tʃ before front vowels involves consonants, vowels, velarity, palatality, occlusion, affrication and the like, i.e. all pieces of the proprietary vocabulary that is used and managed in phonological computation. Such a process does not appeal to any extra-phonological information: this would only be the case if the description were, say, "k turns into tʃ before front vowels, but only in case there is a morpheme boundary between the trigger and the target."
  - There is thus an objective and pre-theoretical means to tell processes apart that use extra-phonological information, and processes that do not. Therefore, we can be sure that *only* domain-specific vocabulary, i.e. the one that is used in the computational system which carries out phonological computation, occurs in the former process. By contrast in the latter, the information that is processed by phonological computation is blended: the specifically phonological vocabulary cohabitates with a carrier of extra-phonological information (a morpheme boundary).
  - If some item, then, never occurs in the "pure" processes, i.e. those that only use specifically phonological vocabulary, we can safely conclude that it is an alien.
  - Obviously, hash marks as much as omegas (prosodic words), phis (prosodic phrases) or any other prosodic constituent from the prosodic word upwards, are never found to participate in processes that do not use morpho-syntactic information. For example, there is no palatalisation of the pure kind "k turns into tʃ before front vowels" where a hash mark, an omega, a phi or anything of that kind is needed. Therefore all of these items are diacritics.
- (29) Apples and bananas in phonology, but not in syntax
- Another obvious issue is that 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 "+" or "#".
  - Calling a unit whose exclusive purpose is to store and release some information a hash mark, an omega, a banana or an apple does not make any difference: any label will do.
  - For some reason, though, phonologists always point out the arbitrariness of the typewriting symbol #, but do not mind talking about omegas and phis.
  - Saying that an omega is only shorthand for a real linguistic object, the phonological word, does not help: the same may be said about + and #, only that a regular scientific-sounding terminology has never been introduced for these objects.

- Finally, pointing out that omegas and phis represent certain stretches of the linear string which coarsely correlate with morpho-syntactic divisions does not make them less arbitrary. Everybody knows that the linear string is chunked into stretches that define the domain of application of phonological processes, and that these stretches more or less closely follow morpho-syntactic structure. The issue is not the coarse equivalence between morpho-syntactic structure and phonologically relevant stretches – it is the nature of the items that are supposed to be inserted into the phonology in order to carry this information.
- ωP ?  
 Finally, it is interesting to observe that only phonologists seem to be happy to live with apples and bananas in their theory: there is no equivalent in morphology, syntax or semantics.  
 No representative of these disciplines would accept, say, an ωP (omega phrase), a #P (hash mark phrase) or a φP (banana phrase). Nodes in morpho-syntactic structure project something, and this something is recorded in the lexicon: items only qualify if they belong to the domain-specific vocabulary of the morpho-syntactic computational system (number, gender, person etc., but no bananas, omegas or hash marks).

## 6. Output of translation: domains are out of business

- (30) Non-diacritic boundaries (can) exist
- A non-diacritic is thus an object that exists in phonology anyway, even in absence of any appeal to extra-phonological information.
  - Lass' (1971) proposal that a boundary materialises as the feature [-voice] in phonology therefore satisfies the non-diacritic requirement: [-voice] exists in phonological processes that have got nothing to do with extra-phonological information.
  - However, we know that melodic primes are no good candidates for the output of translation because melody and morpho-syntax are incommunicado altogether.  
 ==> no time to make this demonstration (see Scheer 2011:§660).
  - Hence the output of translation reduces to items at and above the skeleton:  
 ==> syllabic space
  - Lowenstamm (1999) has introduced another type of carrier of morpho-syntactic information: syllabic space. He argues that the beginning of the word materialises as an empty onset-nucleus pair, the so-called initial CV.
  - The idea that carriers of morpho-syntactic information in phonology identify as syllabic space can be implemented in any (phonological) theory.
    - In CVCV it identifies as the initial CV because of the internal logic of this particular theory, where the minimal (and actually maximal) building block of constituent structure is a CV unit.
    - In other theories, syllabic space will take other forms (x-slots, moras, regular syllabic constituents such as onsets etc.),
    - and this is all to the good because different predictions will be made by the different vocabulary chosen, and hence competing theories can be assessed according to their behaviour at the interface.
  - ==> there is an alternative to diacritic boundaries
    - syllabic space is certainly not a diacritic since it is a necessary ingredient of phonology even in absence of extra-phonological factors.

2. At the same time, it is local, rather than domain-based: just like SPE-type boundaries, syllabic space is necessarily inserted into the linear string at morpho-syntactic divisions.
3. Table (31) below provides a schematic representation of how initial CV units concatenate with regular morphemic material.



- (32) Let us now try to conceive of non-diacritic domains.
- a. top-down constructions are diacritic by definition (prosodic word and higher)
  - b. a non-diacritic domain would have to exist in phonology independently of any issue related to extra-phonological information. Clearly, this excludes all higher layers of the Prosodic Hierarchy.
    1. it is a recognised and admitted fact in Prosodic Phonology that prosodic constituents fall into two categories: those that are top-down, and those that are bottom-up constructions (e.g. Nespov & Vogel 1986:109, Nespov 1999:119, Scheer 2011: §401).
    2. All higher constituents, i.e. from the prosodic word on, represent the former type:
      - the prosodic word
      - the prosodic phrase
      - the intonational phrase
      - the phonological utterance
 in the traditional six-layer system.
    3. these have the additional characteristic that no phonological property contributes to their construction: they come into being through translation, and through translation only (see Scheer 2011: §421).
  - c. On the other hand, prosodic constituents below the word level, i.e.
    - feet
    - syllables
    - eventually moras
 are bottom-up constructions.
    1. they are projections of genuinely phonological vocabulary (ultimately of melodic primes).
    2. Also, the computation that produces them is purely phonological, i.e. in no way influenced by extra-phonological information.
    3. Put differently, the existence of syllables and feet (eventually of moras) is entirely independent of any extra-phonological information: if there were no interface, syllables and feet would still exist, while prosodic words and higher constituents would not.

- (33) interim conclusion
    - a. the higher layers from the prosodic word on are diacritic by definition
    - b. also: higher layers are the projection of nothing – at least not of the terminals that they dominate.  
=> this alone should be enough to disqualify them in linguistic theory.
    - c. the lower bottom-up constructed layers of the Prosodic Hierarchy appear to be sound candidates for non-diacritic domains
  - (34) projections created by phonological computation cannot be the output of translation either
    - a. the lower units of the Prosodic Hierarchy pass the diacritic filter for legitimate carriers of morpho-syntactic information
    - b. They are faced with another problem, though:  
if they are exclusively phonological, i.e. if no extra-phonological property contributes to their construction, how could they ever carry morpho-syntactic information?
    - c. The property that makes them non-diacritic also disqualifies them for being the output of translation.
    - d. syllables and feet (eventually moras) cannot be carriers of morpho-syntactic information because they are the result of phonological computation.  
Like all other domains (except, precisely, the higher layers of prosodic constituency), syllables and feet (eventually moras) are projections of basic vocabulary: syllables (and moras) are a function of segments, while feet are built on syllables.
    - e. Carriers of morpho-syntactic information, though, are necessarily created outside of the phonology, and by a means that is independent of phonological computation.
    - f. Syllables and feet (moras), however, are *entirely* determined by the properties of their terminals. Therefore they do not qualify as the output of translation.
- ## 7. Other violations of modularity
- (35) aside from its diacritic character, the Prosodic Hierarchy cumulates violations of what was identified as a correct interface design.
    - a. For one thing, it is a non-privative means of doing translation: (almost) everything is shipped to the phonology, including irrelevant noise (question 3).
    - b. Also, it defines chunks and thereby replicates the job of cyclic derivation in times where spell-out is selective (question 2, this is the line of attack of Pak 2008 and Samuels 2009a).
    - c. The adaptation of the Prosodic Hierarchy to the constraint-based environment of OT has produced constraint-based mapping, which transfers translation *into* the phonology and thereby destroys the original modular architecture of Prosodic Phonology: translation is necessarily done in modular no-man's land.
    - d. Finally, another point that is unrelated to interface design should be enough to disqualify prosodic constituents: they are the projection of nothing. The (higher layers of the) Prosodic Hierarchy would be only arboreal structure in linguistics whereby the nodes are not projected from terminals, and do not represent any of their properties.

## DAY 3

### 8. Chunk definition in phonology

[Scheer 2011:§99, 2012a,b]

#### 8.1. Competitors

- (36) chunk definition in phonology
- how are phonologically relevant chunks of the linear string defined?  
[A phonologically relevant chunk is a domain of phonological computation.]
  - two competitors:
    - representationally: the units of the Prosodic Hierarchy
    - procedurally: cycles, today phases
  - classically, cycles/phases have no business above the word level.  
=> this has changed with modern phase theory (Chomsky 2000 and following).
    - phases define chunks that are larger than the word
    - the hitherto standard way to define chunks (Prosodic Hierarchy) was weakened by its own proponents by equating prosodic units with phases: so-called prosodic islands.  
=> this is suicidal since absolute isomorphism of phases and prosodic units makes the latter redundant.

#### 8.2. History

- (37) SPE
- only cycles: the Transformational cycle creates chunks below and above the word level.
  - embryo of prosodic constituents: cat-rat-cheese is readjusted in order to create three "sister-adjoined" units (which will later be called Intonational Phrases).
- (38) Direct Syntax  
early 80s: Kaisse (1983, 1985) and Odden (1987, 1990)  
late 70s: Rotenberg (1978), Clements (1978), Pyle (1972), Hyman (1978: 459), Kenstowicz & Kisseberth (1977), Scheer (2011: §131) provides an overview
- representational means eliminated altogether: chunks are defined by direct reference to morpho-syntactic structure (trees) and node labels.
  - no distinct modules, no domain specificity (specific vocabulary) hence no translation  
=> harsh violation of modularity
- (39) 80s: peaceful coexistence that is rarely challenged
- cycles inherited by SPE and promoted by Lexical Phonology  
=> LP: but only below the word level
  - new prosodic constituents  
[Selkirk 1981 [1978], 1984, Nespor & Vogel 1986]  
=> but only at and above the word level, not really below.

- => logical conclusion by Hayes (1989 [1984]): the demarcation line is the word, chunks below are defined by cycles, chunks above are defined by the Prosodic Hierarchy.
- (40) conflict: some early voices  
direction: colonization of small chunks by Prosodic Phonology  
location: below the word level
- competing / coexisting analyses of the same phenomenon  
u\*[m]-predictable vs. im-possible  
- Lexical Phonology: /un-/ = level 2, /in-/ = level 1 affix  
- Rubach & Booij (1984): /un-/ = PrW of its own, /in-/ = same PrW as the root
  - elimination of cycles: prosodic domains below the word level  
Selkirk (1984:412ff), Inkelas (1990)  
Occam-based argument:
    - there cannot be two distinct means for defining chunks
    - prosodic constituency can be extended below the word
    - cycles cannot be extended above the word: postlexical phonology is non-cyclic  
=> cycles have to go

#### 8.3. Prosodic units are manoeuvring themselves into offside

- (41) modern phase theory has changed the landscape quite radically  
=> phases are cycles ABOVE the word level
- prosodic islands  
reaction of the established Prosodic Hierarchy: prosodic islands  
Prosodic islands are isomorphic with phases: FIRST a phase defines the chunk, THEN this chunk is translated into phonological representations in the form of a unit of the Prosodic Hierarchy.  
=> **abandonment of THE fundamental claim of Prosodic Phonology: non-isomorphism.**  
  
Dobashi (2003), Piggott & Newell (2006), Kratzer & Selkirk (2007), Ishihara (2007) and Kahnemuyipour (2009), Elordieta (2008:274ff) offers an informed survey.
  - this is dangerous: another round of Direct Syntax is lurking  
if prosodic and phase structure are exactly identical and isomorphic, Occam commands to get rid of one of them. Since phases are independently needed in syntax, prosodic constituency has to go.  
This argument is typically made by protagonists of DM:  
Pak (2008:42ff), Samuels (2009:284ff), also Seidl (2001).  
  
Hence we are back to the conflict of the 80s, but with the reverse direction: colonization of big chunks by cycles (phases).
  - reaction of orthodox Prosodic Phonology against isomorphism  
=> prosodic constituents ≠ phases
    - "Prosodic domains do not match spell-out domains"  
Cheng & Downing (2007, 2009, 2011a,b), Downing (2010).

2. But here as well phases enter the picture (which was not the case before): alignment constraints take phases as an argument: ALIGN-L(PHASE, INTP) "align the left edge of a phase with the left edge of an Intonational Phrase" (Cheng & Downing 2007, 2009).
3. Phase theory thus impacts chunk definition, albeit only indirectly: the independence of prosodic constituency through its genesis via ALIGN-based mapping is preserved.

#### 8.4. Modular PIC

D'Alessandro & Scheer (in press)

(42) goal #1

##### update chunk definition in phonology

==> reduction to just one chunk-defining device

- a. chunk definition in phonology  
how are phonologically relevant chunks of the linear string defined?  
[A phonologically relevant chunk is a domain of phonological computation.]
- b. since SPE, there are two competitors:  
[Scheer (2011:§423, 2012a:§99, 2012b)]
  1. representationally: #s in SPE, units of the Prosodic Hierarchy since the 80s  
phonological theory associated: ProsodicPhonology
  2. procedurally: cycles, today phases  
phonological theory associated: Lexical Phonology
- c. phase theory has radically modified the landscape  
(but this went by and large unnoticed in phonological quarters):
  1. since Lexical Phonology, post-lexical phonology is supposed to be non-cyclic.  
==> at and above the word level, chunk definition is ONLY representational, i.e. done by the Prosodic Hierarchy.
  2. phase theory obliterates this idea: it defines phonologically relevant chunks above the word level.  
[to the extent that it has any impact in phonology at all]
- d. one independent reason to believe that the Prosodic Hierarchy has to go:  
it is redundant
  1. reaction/adaptation of the established Prosodic Hierarchy to phase theory:  
**prosodic islands**  
Prosodic islands make **prosodic constituency isomorphic with phases**: FIRST a phase defines the chunk, THEN this chunk is translated into phonological representations in the form of a unit of the Prosodic Hierarchy.  
==> **abandon of THE fundamental claim of Prosodic Phonology: non-isomorphism.**  
Dobashi (2003), Piggott & Newell (2006), Kratzer & Selkirk (2007), Ishihara (2007) and Kahnemuyipour (2009). Elordieta (2008:274ff) offers an informed survey.

2. theory cannot afford to do the same labour twice:  
if prosodic and phase structure are exactly identical and isomorphic, Occam commands to get rid of one of them. Since  
- phases are independently needed in syntax  
- the Prosodic Hierarchy has no other purpose in phonology than introducing morpho-syntactic information  
==> prosodic constituency has to go.  
This argument is typically made by protagonists of DM:  
Pak (2008:42ff), Samuels (2009:284ff), also Seidl (2001).

- e. another independent reason to believe that the Prosodic Hierarchy has to go:  
just like #, it is made of diacritics: ω, φ etc.  
In a modular environment, diacritics do not qualify since computational systems (modules) can only understand, parse and process their own proprietary vocabulary.  
Scheer (2008a, 2011:§402, 2012a:§93, 2012b)  
  
==> domain specificity in Cognitive Science  
e.g. Segal (1996:145), Gerrans (2002:261), Cosmides & Tooby (1992), Hirschfeld & Gelman (eds.) (1994), Fodor (2000:58ff).
- f. conclusion  
==> phase theory is the only chunk-defining device.
- e. a case of intermodular argumentation (Scheer 2008b, 2009b)  
[stronger evidence than regular intra-modular arguments]  
shaping phonological by morpho-syntactic theory

(43) goal #2

##### adapting phase theory to the demands of phonology

- a. as it stands, phase theory is unable to describe all phonologically relevant chunks, which are often smaller and more diverse than what phase theory can delineate today.
- b. in order to meet the ambition of goal #1, phase theory needs to be made more flexible.
- c. this demand coincides with the syntax-internal evolution of phase theory:  
since Chomsky's initial take (CP, vP, perhaps DP), there is a constant trend to grant phasehood to smaller and smaller chunks (den Dikken 2007:33 provides an overview, also Scheer 2011:§773).
- d. ==> goal: make phase theory more flexible so that smaller and more diverse chunks can be described.
- e. another case of intermodular argumentation  
shaping morpho-syntactic by demands of the PF-interface.  
==> this is the minimalist/biolinguistic way to go.

(44) trivial empirical fact:

not every phase has a phonological effect (is visible in the phonology).  
(Scheer 2009a,b)

- a. E.g. t-flapping in (relevant varieties of) English, which applies in **all syntactic environments alike** provided the /t/ is word-final and intervocalic (e.g. Nespor & Vogel 1986:46f, 224ff).



- b. at issue  
a white owl  
invite Olivia  
at eleven  
just the other night a racoon was spotted in our neighbourhood
- c. But there are of course phase boundaries within the domain of application of t-flapping.
- d.  $\implies$  phase boundaries are ignored altogether by t-flapping.
- e. this is true for many other external sandhi phenomena:  
 $\implies$  **phonology only exceptionally cares for phase boundaries.**

(45) logical possibilities of (mis)match between Spell-Out and PIC

PIC at syntax	PIC at PF	illustration	phonological phenomenon
+	+	Abruzzese: transitive active $v$	RF
-	+	Abruzzese: unaccusative $v$	RF
-	-	Abruzzese: passive $v$	RF
+	-	Abruzzese: C	RF
		English: $vP$	t-flapping

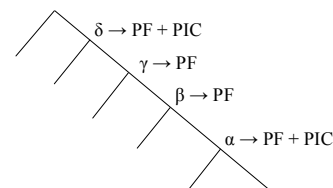
(46) proposal: Modular PIC

[Scheer 2011:§§778, 794, 2012a:§307

- a. the **phase skeleton** is defined in syntax  
= phasehood: which nodes are phase heads, i.e. trigger spell-out to PF?
- b. in a given language, there is only one phase skeleton.  
There may be cross-linguistic variation: different languages have different phase heads (Gallego 2009, 2010).
- c. phases exist independently of the PIC
  1. some phases are endowed with a PIC at PF
  2. other phases are not: there is spell-out, but no effect $\implies$  phonologically vacuous application of spell-out (phases)  
 $\implies$  the PIC is phase-specific
- d. for a given phase, the **PIC is module-specific**  
Phases which leave no footprint in phonology may well have a syntactic motivation for being armed with a PIC *in syntax*.  
For example, this is the case of  $vP$  in t-flapping varieties of English: there is good syntactic reason to assume the existence of a phase endowed with a PIC in syntax, but the same phase has no effect in phonology, hence there is no PIC associated to this phase *in phonology*.
- e. two loci of variation
  1. cross-linguistic parameterisation of phasehood
  2. within a given language, it is decided for every phase whether or not
    - it is associated to a PIC in syntax
    - it is associated to a PIC at PF
    - it is associated to a PIC at LF

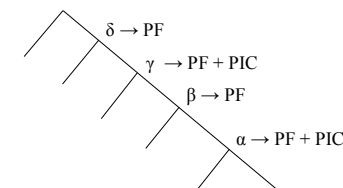
(47) language A

- a. phase heads  $\alpha$  and  $\delta$  are endowed with a PIC at PF
- b. phase heads  $\beta$  and  $\gamma$  trigger vacuous spell-out at PF



language B

- a. phase heads  $\alpha$  and  $\gamma$  are endowed with a PIC at PF
- b. phase heads  $\beta$  and  $\delta$  trigger vacuous spell-out at PF



(48) the global picture

- a. the impact of morpho-syntactic divisions on phonology may be
  1. language-specific (Gallego 2009, 2010)
  2. chunk-specific: class 1 vs. class 2 morphemes (Lexical Phonology)
  3. size-specific: lexical vs. post-lexical phonology (Lexical Phonology)
  4. process-specific  
the same boundary impacts a given phonological process, but not others.  
E.g. English: word-stress is strictly bound by the word, but t-flapping ignores the word boundary.
  5. NEW: module-specific  
not really new in fact: there is a body of literature arguing for asymmetric spell-out at LF and PF.  
Marušič (2005), Marušič & Žaucer (2006), Felser (2004), Matushansky (2005), den Dikken (2007), Megerdooian (2003) and Caha & Scheer (2008).
  6. NEW: phase-specific
- b. we are as much worried as you:  
that many sources of variation weaken phase theory.  
But we are only recalling what is firmly established
  1. empirically
  2. in interface theory

**To sum up: Modular PIC**

Ingredients

- a. PIC-defined spelled-out chunks are invisible for syntactic computation
- b. PIC is also active at PF
- c. PIC-defined spelled-out chunks may be invisible for phonological computation [PIC at PF].

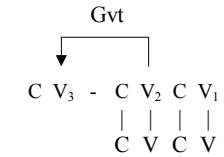
## DAY 4

### 9. Real stuff vs. sleepers: the Direct Effect

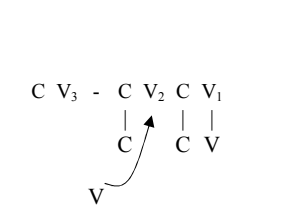
- (49) anything and its reverse can happen at the left edge of a prosodic word
- diacritics are "sleepers" in the sense that they have no effect at all by simply existing: the existence of an "#" in the phonological string does not influence the course of phonology in any way.  
They only have an effect when they are accessed by some phonological rule/constraint: "process X applies within  $\omega$ / before #".
  - also, diacritics have no PREDICTABLE effect: they may trigger any process and its reverse. This, however, is counterfactual since the processes that are observed at word margins for example are anything but random: word margins have very specific and well-known effects.
  - equally probable rules?
    - $V \rightarrow \emptyset / \#C\_CV$
    - $\emptyset \rightarrow V / \#C\_CV$
  - both rules under c) are equally probable and equally natural from the point of view of a theory that uses diacritic boundaries: no property of the theory favours or disfavours the epenthesis into an initial cluster, or the deletion of a vowel in this context.
  - every phonologist knows, however, that c1 is an attested phonological process, while c2 is not on record. That is, there is no "masochistic" language that would delete vowels in initial clusters (and only in this context).<sup>1</sup>
  - therefore theories that cannot discriminate between c1 and c2 have a problem, and the reason why they are in trouble is that the critical information, i.e. word-initiality, is conveyed by a diacritic hash mark.
  - the result is the same in case the prosodic word or some other prosodic constituent carries this information: anything and its reverse may happen at the left edge of a prosodic constituent.
- (50) only one thing can happen after an empty CV unit
- a look at a non-diacritic alternative shows that the two rules at hand are discriminated as soon as the extra-phonological information comes as a real phonological object that impacts phonology directly and does not need to be explicitly mentioned in rules (or constraints) in order to produce an effect.
  - deletion vs. insertion of the first vowel in a word in CVCV

<sup>1</sup> Note that rule (46a) says that vowels are deleted *only* when they occur in word-initial clusters. Of course there are languages where vowels are deleted in this context (e.g. Czech *pes - ps-a* "dog Nsg, Gsg"), but they will then also be deleted elsewhere (Czech *loket - lokt-e* "elbow Nsg, Gsg").

#### 1. deletion: ill-formed



#### 2. insertion: structure saved



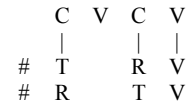
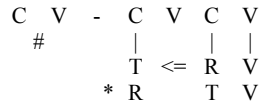
### 10. Interface effects are not random: the beginning of the word

- (51) cross-linguistically stable effects of the beginning of the word [Scheer 2004:§87, 2009a,b, 2012a:§246]
- word-initial clusters  
in some languages initial clusters are restricted to #TR. In others they have the same distribution as internal clusters. But there is no language where they are restricted to #RT (#TT, #RR).<sup>2</sup>
  - strength of word-initial consonants  
in some languages word-initial consonants are especially strong. In others, they do not have any peculiar behaviour regarding strength. But there is no language where they are especially weak.
  - deletion of the first vowel of the word  
in some languages the first vowel of words is unable to alternate with zero. In others it does not show any peculiar behaviour when compared to other vowels. But there is no language where non-initial vowels are unable to alternate with zero, while initial vowels do.
- (52) languages seem to make a binary choice
- either the beginning of the word is in no way peculiar in comparison to what happens morpheme-internally,
  - or it is outstanding and allows only for a characteristic subset of the options that are well-formed elsewhere.
- (53) this is all not random
- if the effect of the beginning of the word is not arbitrary, the representational identity of the object by which it is represented must not be arbitrary either.
  - rather, we are looking for one single object that produces the three effects at hand: three for the price of one.
  - in any event, objects such as the hash mark or some prosodic constituent that do not produce any effect at all (or rather, that tolerate any effect and its reverse under the appropriate rule or constraint) do not qualify.
  - if the effect is predictable, the identity of its trigger cannot be arbitrary.

<sup>2</sup> In this book, T is shorthand for any obstruent, R for any sonorant.

- (54) typological predictions made by the initial CV
- | in a language where the initial CV is present        | in a language where the initial CV is absent                        |
|--|---|
| a. word-initial consonants are strong                | word-initial consonants are non-strong                              |
| b. initial clusters are restricted to #TR            | there are no restrictions: #TR, #RT, #TT and #RR clusters may occur |
| c. first vowels of words may not alternate with zero | first vowels of words may alternate with zero                       |

- (55) presence vs. absence of the initial CV: predictions
- a. initial clusters: initial CV present      b. initial clusters: initial CV absent

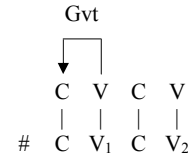
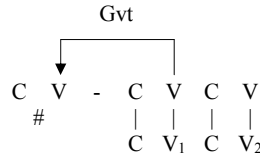


1. \*#RT: two ø's in a row

1. #RT ok

c. initial simplex C: initial CV present

d. initial simplex C: initial CV absent



2. #C strong: #C escapes Gvt  
3. V<sub>1</sub> cannot be absent: two ø's in a row

2. #C is governed (=intervocalic)  
3. V<sub>1</sub> can be absent: only one ø

- (56) review of some languages  
vocabulary items:

- TR-only language = language where #RT, #TT and #RR do not occur  
- anything-goes language = language where #RT, #TT and #RR do occur

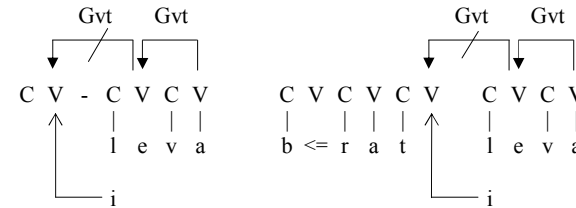
	initial clusters		first V alternates		#C strong	
	#TR	#RT	no	yes	yes	no
a. Czech	x	x		x		?
b. Polish	x	x		x		x (?)
c. Moroccan Arabic	x	x		x		?
d. Greek (classical and modern)	x	x		?		x
e. German (standard)	x			x	x	
f. Belarusian	x			x		

## 11. What the initial CV is initial of

### 11.1. Belarusian i-prothesis

- (57) Belarusian i-prothesis before CVC roots that occur in zero grade
- | context                   | example      | gloss                   |
|---------------------------|--------------|-------------------------|
| a. ## <u>  </u> CVC       | lew          | lion Nsg                |
| ## <u>  </u> CøC-V        | i-lva        | lion Gsg                |
| b. ...C # <u>  </u> CøC-V | brat i-lv-a  | the brother of the lion |
| c. ...V # <u>  </u> CøC-V | šastra lv-a  | the sister of the lion  |
| d. ...C # <u>  </u> CVC   | tam jość lew | there is a lion         |
| e. ...V # <u>  </u> CVC   | malady lew   | young lion              |

- (58) epenthesis into the leftmost of two empty nuclei in a row
- a. epenthesis into the (utterance-) initial CV  
b. epenthesis into the final empty nucleus of the preceding word



- (59) location and causality of Belarusian i-prothesis  
all and only those empty nuclei that remain ungoverned are subject to epenthesis.

### 11.2. Autonomous chunks

Scheer (2012: §294)

- (60) autonomous chunk sizes
- a. autonomous chunk size: the word (no connected speech)  
[[Peter] [[saw] [[his] [friend]]]]
- b. autonomous chunk size: the utterance (connected speech)  
[Peter saw his friend]
- (61) distribution of the initial CV  
empirical situation known thus far
- a. at the beginning of the word  
b. at the beginning of an utterance

(62) prediction autonomous chunks and their behaviour according to the presence of the initial CV

	effect 1 morphemes are TR-only	effect 2 #C is strong	effect 3 the first vowel of words is stable
a. type A word-initial CV	yes	yes	yes
b. type B utterance-initial CV	yes	no	no
c. type C no CV distributed	no	no	no

(63) grey-shaded cell unexpected word-initial CV absent, but its effect (TR-only morphemes) is visible.

- (64) Lexical vs. online effects of the initial CV
- effect 2 (#C is strong) and effect 3 (first vowel of words is stable) are the result of online computation
  - the existence of #RT-initial morphemes is a lexical property of each item. Online computation, however, cannot impact lexical properties of morphemes.
  - #RT-initial lexical pieces are grammatical in a type B language, but may be absent from the lexicon.

- (65) why do #RT-initial items not freely occur in type B+C languages?
- Two answers
- the absence of #RT-initial lexical items is an accidental gap
  - the utterance-initial CV that is present in these languages induces lexicon optimisation

- (66) Type A > type C (no initial CV at all)
- evolution: eliminate all initial CVs  
Result: #RT-initial items are grammatical in all positions.
  - In order for a type A language to acquire RT-initial morphemes, some time will have to pass so that either new lexical items come in (acronyms, borrowings etc.), or native phonological processes create RT-initial items based on the TR-only stock.
  - Slavic  
when the yers fell out: while Common Slavic was a TR-only language, daughter languages such as Czech or Russian accommodate RT-initial morphemes when #R-yer-TV become #RTV.
  - French (change ongoing)  
*reprends* [ʁpʁã] *du gâteau*

- English (change ongoing)  
Davidson (2006)  
#TR p'lice, c'rээр, t'rífic, b'lieve  
exotic #TR b'nána, t'mórow  
#TT p'táto, t'bléau, t'pólogy, c'hésion,  
but  
\*#RT n'gléct, l'gítimate, l'cáte, r'céive, r'fúse, r'táin
- Southern varieties of German (Swabian, Bavarian)  
standard *gehabt* [gəhapt] "had (past part.)"  
Swabian [kheet]  
Bavarian *pfiat di* ==>?? < behüte Dich (>b'hüte > h causes affrication of p)

- (67) Type A > type B (utterance-initial CV):
- lexicon optimisation
    - RT-initial items can occur freely in utterance-internal position, but are ruled out utterance-initially.
    - the lexicon is shaped according to the conditions that lexical items experience during computation.  
==> prefer inputs that are well-formed outputs.  
Yip (1996), Bermúdez-Otero (1999: 124)
  - repair  
Belarusian i-prothesis.
- (68) "autonomous chunks" are phases
- hence  
what the initial CV is initial of are phases
  - two cases  
the utterance-phase  
the word phase
  - the initial CV is a marker of the left phase boundary
  - these two specific chunk sizes are critical and recurrent "barriers" for phonological processes across languages.
  - they don't make sense syntactically speaking:
    - there is no such thing as a word
    - an utterance is not a CP: it is the highest CP.

### 11.3. Syntactic phases and their phonological traces

(69) bumpy match between syntactic and phonological evidence for phases

phases (syntactic evidence)	autonomous chunks (phonological evidence)	
CP	utterance	good match
vP	–	no phonological trace
TP	–	no phonological trace
DP	–	no phonological trace
...	–	no phonological trace
–	word	no syntactic trace

- (70) trivial empirical fact
- a. phonology is only exceptionally affected by syntactic phases.
  - b. In 90% of the cases, there is no phonological trace of what is supposed to be a phase.
  - c. phonological and syntactic diagnostics for phasehood do not converge at all.
  - d. if there is a vP phase, then this phase is ignored by typical external sandhi phonology:
    1. English t-flapping
    2. Belarusian i-prothesis
    3. Corsican spirantization
    - etc.
  - e. conclusion:
    - spell-out is symmetric, but allows for free rides
    - Modular PIC

## DAY 5

Play ppt on Hebrew.

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