When all instructions are in the lexicon

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1. Background In the history of syntactic theory, we have seen several traditions of schools (e.g. categorial grammar, minimalism) that claim that the computational machinery of natural language is completely uniform (and simple across languages), and what differs from one language to the next is the lexical material. This has among other things as an advantage that the only thing a child has to learn is the lexicon — something she presumably has to learn in any case. Oddly, this idea have never been implemented within (3D) phonology (there is a categorial rendering of syllable structure in the work of Wheeler 1982). I give a quick tour of what would need to be done to make this work.

2. Prosodic structure. Some languages have complex onsets, others do not. Assuming binarity, this means that in languages allowing for complex onsets, certain consonants can optionally combine with other consonants on their right to form an onset. Extending notation from categorial grammar, we can say that in such languages e.g. obstruents are marked as follows:

- *p, t, k,...*: C / C%

Where A/B means: a thing which gives an A when combined with a B on its right, and the ampersand means: zero or one instances. Different from categorial grammar, and in line with the Borer/Chomsky hypothesis, we assume objects like C / C

3. Subsegmental structure. Features can of course also be combined in feature trees. In this case there is no linear ordering, but a relation of 'belonging to the same segment'. A feature A⊃B means: is an A, if connected to a B in the same segment. We can then have types three features:

- A ⊃ B% (combines with 0 or 1 B to form an A) (i.e. Voice⊃Labial: voice can combine with Labial or not)
- A ⊃ B (combines with obligatory B to form an A) (i.e. Labial⊃Voice in languages with obligatorily voiced labials)
- A ⊃ ∗ B (can only be an A if there is no B, e.g. Labial⊃Velar in a language that does not allow labiovelars)

3. Morphological Colours. The system above can describe most of static prosodic and segmental phonology fairly well, mimicking standard ideas on phonology, but with a maximally simple computational operation, similar to syntactic Merge (taking to elements as input and computing their output).

In order to make it also work for phonological processes, we need to include colours (Van Oostendorp 2007 e.a., Trommer and Zimmermann 2014) into the equation. The B in feature specifications such as those above can have a colour (i.e. being marked as belonging to the same morpheme, or not). We mark these colours by indexes on black-and-white abstracts:

- $A_i \supset B_j$ (combines with obligatory B to form an A) (i.e. Labial⊃Voice in languages with obligatorily voiced labials)

means that the segment has to be combined with a B of a different colour, i.e. outside of its morpheme. This will cause and describe vowel harmony. Languages with such a process have this feature; other languages do not.

(This talk will be purely formal and have no 'data'.)