

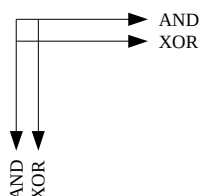
Phonology is an empty tridimensional cube

Enguehard, Guillaume

My aim is to argue that phonology is exclusively made of operators AND and XOR. Distinctive units emerge by the interaction between these and emptiness.

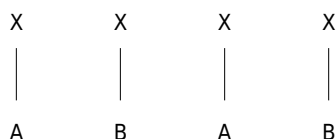
The relevant phonological operations are commutation (*dog ~ bog*) and permutation (*dog ~ god*). Hjelmslev (1943) proposed that these are handled by relations XOR and AND respectively. The first is responsible for *oppositions*. The second is responsible for *linearity*. In autosegmental phonology, XOR and AND are not limited to these relations. AND underlies *assimilations / association lines*, and XOR underlies *dissimilations / OCP*. Thus operators apply in two dimensions (1): AND applies in the syntagmatic and the autosegmental dimensions; XOR applies in the paradigmatic and the syntagmatic dimensions. This organization is what I will call ‘phonological space’.

(1)

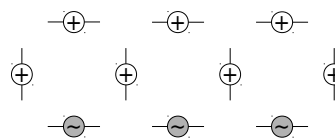


Now I will show that it is possible to derive the number of melodic primes (three for sure: AIU) based on the relational organization of the word itself. See the autosegmental representation in (2a) and its “operatoral” equivalent in (2b). Units are represented by empty points. Skeleton and associations are conditioned by AND (white). Melodic tiers are conditioned by XOR (grey).

(2) a.

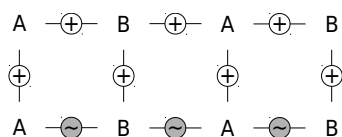


b.

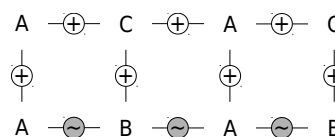


Operators define each empty point as a variable. Variables connected by XOR are necessarily distinct, while variables connected by AND can be identical or not. Provided that all relations are themselves connected by AND relations (they form a system), A+B and A~B in (3a) are contradictory. Thus a third distinct variable is necessary to preserve a well-formed structure: C (3b).

(3) a. *

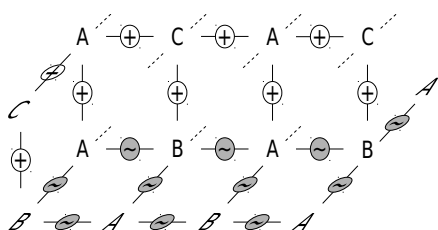


b.



This derivation of three basic units ABC is based on the contrastive and linear aspects of the syntagmatic dimension. However, a paradigmatic dimension is necessary in order to distinguish words. Constellations of paradigmatic oppositions would bypass the restriction on basic units. Thus, one needs to assume a linear organization of the paradigmatic dimension ensuring that each point is connected to two other points only (4a). Such a linearity is, as mentioned earlier, defined by AND. In other words, there is no formal dichotomy between paradigmatic and syntagmatic dimensions: both involve XOR and AND. They differ only in speech (syntagm is heard, paradigm is not). In this respect, the paradigmatic dimension of one word can be the syntagmatic dimension of another word. Imagine a crosswords-like organization of phonological space: the substance of each point is determined by its relations in two crossing syntagms. Following this original perspective, the lexicon is directly built in an empty phonological space organized as a cubic grid (4b).

(4) a.



b.

