On association lines

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0. This paper is part of a larger project attempting to derive some aspects of Autosegmental Phonology from structural phonology. In order to prevent the circularity inherent to inductive analyses, I purposefully do not address linguistic data. I focus on two theoretical questions: **i.** what is an association line; and **ii.** why do we need it for phonetic realizations?

1. Distinctive operations of phonology are permutation and commutation (Hjelmslev 1943). Permutation is achieved by interchanging two units in the syntagmatic dimension (e.g. ***dog*** ~ ***god***). Commutation is achieved by interchanging two units in the paradigmatic dimension (e.g. ***dog*** ~ ***b****og*).

Trubetskoy (1939) and Hjelmslev (1943) distinguish two types of distinctive units: *phonemes* and *prosodemes*. Phonemes can permutate (1a.i, ii) and commutate (1a.iii, iv). Prosodemes can only permutate (1b.i, ii) or they can only commutate (1c.iii, iv).[1]

(1)	a. *phoneme*		b. *prosodeme* (type A)		c. *prosodeme* (type B)	
i.	[patɛʁ]	'peg'	[muˈka]	'flour'	*[eɪht]	
ii.	[paʁtɛ]	'(he) left'	[ˈmuka]	'torment'	*[teɪh]	
iii.	[paʁtɛʁ]	'flowerbed'	*[ˈmuˈka]		[heɪt]	'hate'
iv.	[patɛ]	'stalemated'	*[muka]		[eɪt]	'eight'

Accordingly, the difference between a phoneme and a prosodeme is dimensional. A phoneme is determined by distinctive relations in two dimensions (2a). A prosodeme is determined by distinctive relations in one dimension (2b, c).[2]

(2)   a. *phoneme*   b. *prosodeme* (type A)   c. *prosodeme* (type B)
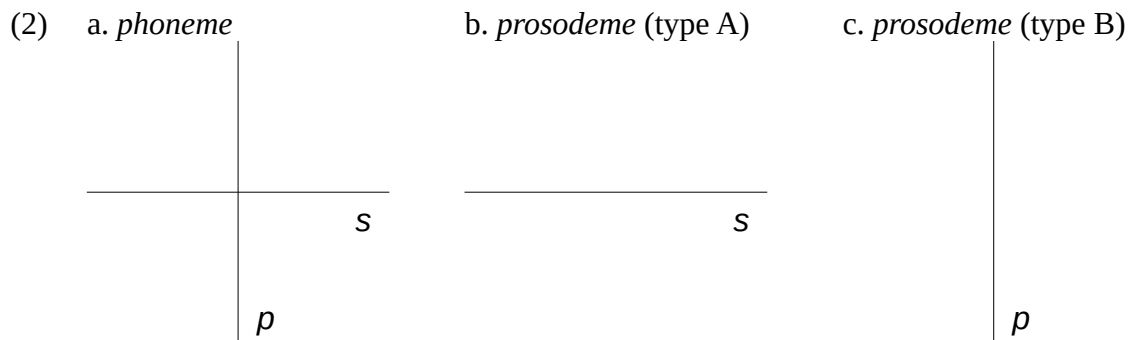
Units determined by the syntagmatic dimension roughly correspond to the skeletal positions of Autosegmental Phonology. Units determined by the paradigmatic dimension correspond to features. Consequently, an association line between a position and a feature is the representation of an intersection between the syntagmatic dimension and the paradigmatic dimension (i.e. the phoneme in 2a).

2. Unlike phonemes, prosodemes cannot be realized by themselves. It follows that a distinctive unit can be realized *iff* it results from an intersection. The question is ***why?***

Minimally, the phonetic realization is a function that associates each element of A to an element of B. Each input element of A must be delimited in order to be associated to its own output. If we represent dimensions with continuous lines, the delimitation of a specific point necessarily involves an intersecting line (i.e. a second dimension with no space in the first

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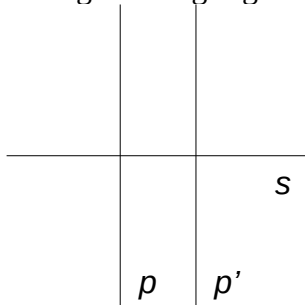1. Data in (1a), (1b) and (1c) are from French, Russian and English respectively.
2. *s* and *p* mean *syntagmatic dimension* and *paradigmatic dimension* respectively.

dimension). In the same way, distinctive positions and distinctive features can be associated to an output *iff* they are delimited by an intersection between the syntagmatic and the paradigmatic dimensions. In sum, phonetic realizations require association lines because these define the input elements of the function.

3. I argue that this definition of association lines sheds a new light on spreading and the Line Crossing Constraint (Goldsmith, 1976).

Neighbouring segments are manifestations of the paradigmatic dimension at two adjacent points of the syntagmatic dimension (3a). Unlike neighbouring segments, the positions of a long segment are interchangeable (e.g. $a_1a_2 = a_2a_1$). Thus spreading is an operation that makes two points of the syntagmatic dimension equivalent. Such a result is achieved in (3b). If two paradigmatic lines fuse at the same point of the syntagmatic dimension, then: **i.** they provide the same feature (i.e. the same point); and **ii.** they delimit two equivalent positions (i.e. two equivalent intersections between paradigmatic and syntagmatic lines).

(3)　　a. neighbouring segments　　　　　　b. *long segment (spreading)*
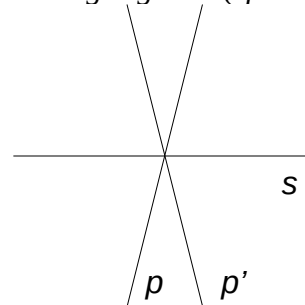
Following the configuration in (3b), there cannot be any intervening segment within a spreading domain. If two paradigmatic lines *p* and *p"* fuse at one point of the syntagmatic dimension, then all intervening intersections necessarily fuse at the same point (4), thus providing the same feature. In other words, spreading is a narrowing that makes intervening segments impossible. This contrasts with traditional representations where spreading is represented as a widening that makes intervening segments expectable (though prohibited).

(4)　　*Line Crossing Constraint*
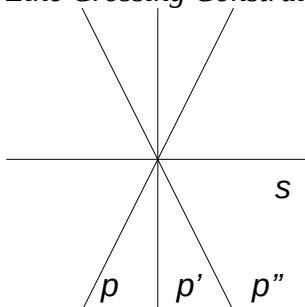
4. To conclude, I argue that the main principles of Autosegmental Phonology can be derived from the definition of distinctive units with respect to syntagmatic and paradigmatic dimensions. In that sense, Autosegmental Phonology is not a theory, but a theoreme of structural phonology.

Goldsmith, J. (1976). *Autosegmental Phonology*. PhD dissertation. University of Chicago. **Hjelmslev**, L. (1943). *Prolegomena to a Theory of Language*. [1961]. University of Wisconsin Press. **Trubetskoy**, N. (1939). *Principes de phonologie*. [1949]. C. Kliencksieck.