‘The nesting machine’. Jordi Fortuny
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In this talk I shall present the central idea of Fortuny & Corominas (forthcoming). On the basis of Kuratowski’s (1921) general theory of order, itself defined on the foundamental terms of axiomatic set theory, I shall propose a precise definition of the combinatorial procedure by which the syntactic component of the faculty of language generates hierarchically structured expressions.

Given a finite alphabet $A = \{a_1, a_2, \ldots, a_n\}$, at the first step s_0 of a derivation, the ‘nesting machine’ generates the set M_0, which is an element of A. At the following step s_1, it generates a new set, M_1, by forming the union of M_0 and a member of A. At step s_n, it generates the set M_n, which is the union of M_{n-1} and an element of A. When $a_i \in A$ comes into the computation at the step s_k, it becomes an occurrence a_i^k of a_i. This can be summarized through the recursive operation:

$$M_0 = a_i^0$$
$$M_{n+1} = a_k^{n+1} \cup M_n$$

Let the final outcome of this machine be $\boldsymbol{N} = \{M_0,\ldots, M_{n+1}\}$, a set whose elements are the Ms generated through the successive derivation. $\boldsymbol{N}$ has the important property of being a ‘nest’, i.e., a set whose elements are sets linearly ordered by inclusion.

If the syntactic algorithm is a nesting machine, the common syntactic relations can be readily defined with no need to introduce any idiosyncratic grammatical element. Not only the linear order among the terminals of an expression can be properly defined on the basis of Kuratowski’s set-theoretical definition of order, as advanced in Fortuny (2008), but also the constituency relationship and the dominance relationship.

We shall also allow the nesting machine to perform $A \cup B$ when:

(a) A or B are nests, and
(b) when B belongs to the domain of A.

If the circumstance (a) is allowed, the nesting machine has the capacity to comprise not only a sole derivational space (‘single nesting’) but also multiple derivational spaces (‘complex nesting’), in which case the outcome of a particular derivational space D_i feeds a different derivational space D_j. Some basic conditions on complex nesting will be presented. Circumstance (b) is equivalent to Chomsky’s (2001, 2005) intuition that Merge can be internal, not only external. We shall provide the means to represent chains comprising multiple copies of an occurrence and to distinguish among copies, again without resorting to further assumptions or postulating grammatical idiosyncracies.

We shall conclude by noting that the importance of nestedness as a unifying concept may be beyond the general theory of order and the syntactic configurational theory of linguistic expressions, by suggesting the new course we begin to undertake.