

Recursion, Merge and Event Sequence: A Bio-Mathematical Perspective

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Abstract : Formalization is indeed a foundational Mathematical Linguistics as demonstrated by the pioneering works. While dialoguing with this frame, we nonetheless propose, in our approach of language as a real object, a mathematical linguistics/biosemiotics defined as a dialectical synthesis between induction and computational deduction. Therefore, relying on the parametric interaction of cycles, rules, and features giving way to a sub-hypothetic biological point of view, we first hypothesize a factorial equation as an explanatory principle within Category Mathematics of the Ergobrain: our computation proposal of Universal Grammar rules per cycle or a scalar determination (multiplying right/left columns of the determinant matrix and right/left columns of the logarithmic matrix) of the transformable matrix for rule addition/deletion and cycles within representational mapping/cycle heredity basing on the factorial example, being the logarithmic exponent or power of rule deletion/addition. It enables us to propose an extension of minimalist merge/label notions to a Language Merge (as a computing principle) within cycle recursion relying on combinatorial mapping of rules hierarchies on external Entax of the Event Sequence. Therefore, to define combinatorial maps as language merge of features and combinatorial hierarchical restrictions (governing, commanding, and other rules), we secondly hypothesize from our results feature/hierarchy exponentiation on graph representation deriving from Gromov's Symbolic Dynamics where combinatorial vertices from F_e are set to combinatorial vertices of Hie and edges from F_e to Hie such as for all combinatorial group, there are restriction maps representing different derivational levels that are subgraphs: the intersection on I defines pullbacks and deletion rules (under restriction maps) then under disjunction edges H such that for the combinatorial map P belonging to Hie exponentiation by intersection there are pullbacks and projections that are equal to restriction maps RM_1 and RM_2 . The model will draw on experimental biomathematics as well as structural frames with focus on Amazigh and English (cases from phonology/micro-semantics, Syntax) shift from Structure to event (especially Amazigh formant principle resolving its morphological heterogeneity).

Keywords : rule/cycle addition/deletion, bio-mathematical methodology, general merge calculation, feature exponentiation, combinatorial maps, event sequence

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