Beyond free variation:
A probabilistic hierarchy in cumulative intensifying prefixation

Ivan Lacić Martina Verdelli

Universitat Pompeu Fabra Università degli Studi di Bergamo

While evaluative morphology (EM) has attracted increasing theoretical and empirical attention in recent years, affix ordering within multi-affix evaluative constructions remains poorly understood. Research on ordering in EM has focused almost exclusively on diminutivization (Manova & Winternitz, 2011; Efthymiou et al., 2026), where combinatorial regularities have been documented across languages. Intensifying prefixation has received comparatively little attention, and the prevailing view holds that "in [intensifying] prefix cumulation, [...] synonymous prefixes are not constrained in their collocation and are in fact mutually exchangeable" (Merlini Barbaresi, 2012, p. 9) – that is, their linear order is arbitrary. The present study shows that grammatical interchangeability does not entail free variation in usage.

We examine 312 multi-prefix adjectival types formed with six functionally equivalent Italian intensifying prefixes – *arci-*, *extra-*, *iper-*, *stra-*, *super-*, *ultra-* (e.g., *super-iper-bello* 'super-hyper-beautiful') – collected from five corpora of written and spoken Italian.

We first ask whether these orderings exhibit global organization at all, adapting the acyclicity diagnostic of Hay and Plag (2004) and Plag and Baayen (2009) to gradient data. Both orders occur for every prefix pair, yet one order is preferred in each pair. These preferences are transitive – no Condorcet cycles arise across the 20 triples – and jointly define a single ranking:

$$\textit{super-} \succ \textit{iper-} \succ \textit{arci-} \succ \textit{ultra-} \succ \textit{extra-} \succ \textit{stra-} \tag{1}$$

consistent with all 15 pairwise preferences. Under the corresponding permutation null, such a configuration would arise only 2.2% of the time. The ordering is nevertheless gradient rather than categorical: *super-* and *stra-* are stably anchored at the extremes, whereas the interior positions are less stable. Thus, although no grammatical constraint determines a unique order, usage is far from randomly variable.

We then ask what this emergent hierarchy tracks. Since prefixes impose minimal formal selectional restrictions (Zirkel, 2010) and their stacking contributes only incremental intensification (Rainer, 1986), we draw on COMPLEXITY-BASED ORDERING (Hay, 2002; Plag & Baayen, 2009) to relate positional preferences to the distributional properties of the prefixes themselves. We operationalize two such properties on `InTens` (Lacić, 2025): (i) base entropy (BE), measuring how broadly a prefix is distributed across bases as a proxy for productivity, and (ii) paradigmatic surprisal (PS), indexing expressive markedness. The two are strongly negatively correlated ($\rho = -0.77$), broadly supporting the view that frequent, productive intensifiers tend to be less expressively marked (Bennett & Goodman, 2018).

A mixed-effects logistic regression on pairwise contrasts shows that ΔBE predicts linearization ($\beta = 0.64$, $p < 0.001$), whereas ΔPS does not. Because PS is a monotone transform of prefix frequency, these results indicate that ordering is not simply a reflection of how often a prefix occurs: what matters is how broadly its use is distributed across bases.

The observed ordering correlates positively with the BE ranking ($\rho = 0.71$), although the correspondence is imperfect. The clearest departure is *arci-*, which occupies an intermediate position in the ordering despite low productivity, plausibly reflecting its archaic status and partial lexicalization.

What has been described as free variation thus proves to be systematically organized: a paradigm of synonymous, formally unconstrained prefixes develops hierarchical structure of the kind documented for prototypical derivation, with more broadly combining prefixes tending toward the periphery. The hierarchy is not imposed by the grammar but emerges from the distributional histories of the prefixes themselves. This suggests that apparent free variation in morphological structure may conceal usage-based regularities, with categorical ordering restrictions representing one end of a broader gradient phenomenon. Although grounded in Italian data, the pan-European nature of intensifying prefixation (Rainer, 2025) suggests that similar ordering principles may extend cross-linguistically.

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