

The imperfectability of morphology From analogy to anomaly (and back again)

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The status of (ir)regularity

A dynamic trade-off between regular patterns and irregular forms has long been recognized as a feature of language in general – and morphology in particular. In formalized grammatical descriptions, this dynamic is manifested in a contrast between patterns that conform to primary analytical devices, and ‘exceptional’ residues that are attributed to auxiliary strategies (or excluded as falling outside the scope of systematic description). The stable coexistence of regular patterns and irregular residues has wide-ranging implications for the study of language. An implication for theoretical models is that the organizing principles of a linguistic system cannot be formulated in wholly system-internal terms. Conditions such as the ‘One Form, One Meaning Principle’ (Anttila 1977: 55) or the ‘Paradigm Economy Principle’ (Carstairs 1983) may capture recurrent tendencies in morphological systems. But these conditions do not express constraints that apply to morphological systems, but symptoms of more general factors. To explain why the patterns described by system-internal conditions arise, and why there are exceptions to these conditions, a model must refer to the external factors that determine the division of labor between regular strategies and irregular formations.

Two types of external considerations have been shown to play an especially significant role in molding the structure and organization of grammatical systems: factors that impact learning, and factors that impact processing (Blevins et al. 2017; Marzi et al. 2019). These factors are in turn influenced by the nature and extent of variation in a system. Relevant dimensions of variation include the following:

- Size and complexity of inflectional paradigms
- Size and transparency of derivational families
- Size and uniformity of open-class words
- Size and complexity of syntagmatic word realizations

The dynamic character of language is reflected in trade-offs at multiple levels. Factors that facilitate learning often inhibit processing, and vice versa. Systems may tolerate high uncertainty along a paradigmatic or syntagmatic axis but seem to be intolerant of simultaneous spikes along both axes (as indicated in the study of Filipović Đurđević & Milin 2018). At a functional level, there are apparent learning and processing benefits of minimizing the vocabulary size and morphological complexity of a language. Yet any such simplification is also likely to have a negative impact on the communicative potential or efficiency of the language.

More generally, optimization along one dimension of a system will tend to incur a cost along another. This dynamic trade-off entails that language is not only not 'optimal' or 'perfect' but that it is also neither optimizable nor perfectible. Examination of statistical patterns also reveals systematic patterns of 'anti-regularity', but never full irregularity. For example, there appear to be no morphological systems with paradigms consisting of equiprobable cells. From a system-internal standpoint, there is no reason why cells could not show a uniform distribution. However, from an external perspective, a system of this nature can be shown to be unlearnable and, arguably, unprocessable (and, ultimately, unsuited to communicative use).

Approaching languages as **complex systems** (Beckner et al. 2009; Ellis 2016) accommodates the different ways that individual languages balance the constraints imposed by external factors. From a complex system perspective, each grammar represents a distinctive 'solution' to the challenge of balancing trade-offs, principally those that relate to acquisition and usage. Hence, an analysis of the organization of a grammatical system must be grounded in an understanding of the external pressures imposed by learning and use (along with factors that reflect the influence of historical contingencies). Of equal importance are the interactions between competing or cumulative pressures. The uncertainty balancing reported in Filipović Đurđević & Milin (2018) suggests that there may be no fixed ceiling on paradigmatic or syntagmatic complexity in isolation. Instead, the operative constraints apply to elements in specific contexts of use.

General goals of the workshop

The proposed workshop has three complementary goals. The first is to contribute to a typology of 'splits' that can coexist in a single system. The second is to explore the space of language-external principles that describe attested splits and shed some light on where the boundaries of possible language-internal variation may lie. The third goal is to generalize over descriptions and principles to identify whether any functional or communicative considerations favor particular splits

over other possible divisions of labor. The rich yet tractable variation exhibited by morphological systems provides an ideal domain for investigating language-internal splits, and the diverse morphological research communities offer a range of perspectives on this variation.

The participants in the workshop each represent a distinctive approach to analyzing the coexistence of regular patterns and irregular residues. These approaches are united by (i) the aim of accounting for whole systems in actual use, rather than curated data sets, (ii) the goal of understanding the functions and mechanisms that contribute to the preservation of system-internal variation, and (iii) the recognition that the parts of a system are neither canonical nor defective.

Descriptive goals of the workshop

In many languages, inflectional paradigms and classes show exemplary regularity. Yet even predominantly uniform inflectional systems often contain gaps, and/or seemingly superfluous or exceptional forms. Apart from the observation that exceptional elements tend to be frequent (and, thus, less prone to regularization), comparatively little is known about these elements. The analysis of Polish allomorphy in Divjak et al. (2021) indicates how exceptional allomorphs may receive support from a system that compensates for their lower probability. There are no well-documented cases of languages in which exceptional forms are in the majority, let alone languages consisting entirely of exceptional elements. It is tacitly assumed that there are limits on ‘exceptionality’ and that there are bounds on the proportion of elements that do not conform to larger patterns in a language. However, there have been no systematic attempts to probe these limits, determine the range of attested proportions, or identify factors that may facilitate or inhibit exceptionality.

The proposed workshop aims to encourage researchers to begin to investigate these questions, and to explore possible trade-offs between regularity in one part of a system and exceptionality in another. The ultimate goal of this descriptive initiative is an initial typology of language as complex adaptive systems, consisting of unlike components.

Theoretical goals of the workshop

Questions related to the division of labor between regular patterns and exceptional elements have previously been raised from a number of different theoretical perspectives. Some of the most direct counterparts are found in usage-based models, particularly in the context of discussions of degrees of schematicity, entrenchment, and conventionality (Langacker 2009, 2019). Within the information-theoretic tradition, notions of word surprisal (Hale 2003), paradigm entropy (Ackerman & Malouf 2013) and relative entropy (Milin et al. 2009)

measure a dimension of exceptionality in the degree of deviation of word units from expected patterns of form or distribution. Even the frequency effect, one of the most robust predictors of language behavior, shows fascinating heterogeneity – i.e., exceptionality (Divjak 2019).

Explanatory goals of the workshop

The third aim of the workshop is to build on empirical descriptions and theoretical analyses to arrive at tentative **explanations**, functional or otherwise, for recurrent patterns of adaptation. The ubiquity of splits naturally invites questions about the ways that regular/exceptional hybrids might contribute to the resilience or robustness of a linguistic system. Given that noisy deviations are intrinsic to the system, it is appropriate that user-based responses should involve statistical approximation and mechanisms for filtering the signal from noise (i.e., error-correcting). In human learning, these same properties compensate for complex and often unpredictable input from the environment. The role that variation plays in facilitating learning is summarized by Bernard Widrow in terms of the following dynamic. On the one hand, the patterns of learning “exhibit some statistical regularities” which “make generalization possible” (Widrow & Lehr 1990: 1419). On the other hand, the limiting capacity of the learner also “improves its ability to generalize” (p. 1422).

As products of co-evolution, language users and language systems are closely attuned to one another. Exceptionality in language generally, and morphology specifically, might be calibrated to a user’s limits in learning and processing. That is, the co-existence of regular patterns and a stock of exceptions might be both necessary and sufficient for generalization to take place, which in turn supports efficient performance and successful adaptation. A perfect language system might be maladapted by encouraging ‘overfit’ that make the language user intolerant of discrepancies in attested patterns and fully unprepared to accommodate unseen patterns. Such a speaker would suffer from severe limitations, characterized by rigidity in comprehension and formulaic productions. This is not why we use language, and how we communicate. Linguistic analyses have tended to focus on regular patterns and prioritize the description of phenomena that conform to general rules over those that are more probabilistic in nature. Rules are best adapted to the description of situations that exhibit a high degree of certainty (whether *extremely* probable or improbable). Probabilistic descriptions are applicable when there is less certainty but uncertainty nevertheless remains within bounds and the outcome is reasonably predictable. When even the latter condition is not met, a system does not simply give up; instead, it engages with whatever degree of systematicity is present in the usage-events. That residual sys-

tematicity will leave traces which will be learned over time to the extent possible. Learning these traces will eventually make (some) prediction possible, even though it is unlikely to become error-free.

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