

MEASURES AND MECHANISMS IN MORPHOLOGY

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Over the past half-dozen years, the results obtained across different domains of morphology have converged to yield a coherent perspective on morphological analysis. The information-theoretic measures initially applied to the analysis of response latencies (Kostić 1991; Moscoso del Prado Martín et al. 2004; Milin et al. 2009) have proven equally useful for modelling variation and structure in morphological systems (Ackerman & Malouf 2013; Blevins 2016). The discriminative learning models that help to explicate the course and outcome of morphological acquisition (Ramscar et al. 2010, 2013) also support integrated models of comprehension and production (Baayen et al. 2011) that avoid the combinatorial explosion faced by earlier exemplar-based accounts (Baayen et al. 2013, 2016), and challenged models that presuppose meaning-blind, obligatory decomposition at the morphemic level (Milin et al. 2017). The central role of a cognitively plausible learning rule provides a point of contact with the learning processes proposed in neurally-motivated models of lexical and morphological knowledge (Chersi et al. 2014; Pirrelli et al. 2015).

The evolution of these approaches has reached the point where it is possible to reinforce claims for the cognitive validity of quantitative measures of global uncertainty by establishing correspondences between uncertainty measures and processing mechanisms within ‘wide-learning’ models, such as the Naive Discriminative Learning model. This talk argues that the global system entropy measures estimated from corpora can be related to features of a discriminative learning network based on the Rescorla-Wagner equations. In part, global uncertainty will reflect the uncertainty in the transitions between nodes in the network. A second component is provided by the median absolute deviation of all non-negligible weights in the network (MAD), which captures competition effects due to lexical neighbourhoods.

Establishing a correlation between measures and models is mutually beneficial. Linking quantitative measures of morphological informativity to components of a learning/processing model supports the claim that these measures capture cognitively relevant patterns of organization. At the same time, the correlation lends support to the idea that the learning mechanisms incorporated in a wide learning network play a role in guiding the development of larger empirical patterns.

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