Contribution ID: **47** Type: **Talk**

Taking morphology a level higher: A lemma-extended interactive activation model

Friday, June 23, 2017 1:50 PM (20 minutes)

Much psycholinguistic research has provided evidence for the surface-form segmentation of complex words, but comparatively less attention has been paid to the organisation of morphology at 'higher levels'(but see Marelli & Baroni, 2015). Although several models of morphological processing make use of a lemma level interacting with morpho-orthographic representations, such proposals are not detailed enough to generate quantitative predictions. At the same time, explicit computational models of word recognition have not yet incorporated these theoretical developments.

Here, we mitigate these gaps by proposing a novel, implemented computational model of morphological processing, which extends the original Interactive Activation framework of visual word recognition (McClelland & Rumelhart, 1981) with a (structured) layer of lemmas. The main tenets of the Lemma-Extended Interactive Activation (LEIA) model are: obligatory decomposition into stems and affixes; separate (underspecified) lemma representations for marked and unmarked stems; and between-lemma excitatory and inhibitory links.

In three sets of (proof of principle) simulations, all with the same parameter values, we show that LEIA produces close quantitative fits to a variety of previously reported priming effects. **Study 1** examined priming between lemma-related forms. LEIA produces stronger priming for regular morphology, weaker facilitation for irregular morphology, and inhibition for orthographic relatives (Crepaldi et al., 2010). **Study 2** demonstrates stem priming asymmetries, with reduced priming from unmarked to marked stems, compared to the reverse (Bosch & Clahsen, 2015). In **Study 3**, we show that LEIA can account for the intricate pattern of stem homograph effects, producing facilitation or inhibition from stem homographs (and their allomorphs), depending on prime duration (Badecker & Allen, 2002).

We have taken the first steps towards a fully specified theory of morphological processing. Our results suggest that a lemma level, with properties like the ones outlined above, may be one of the assumptions indispensable in such a theory.

Primary author: VERÍSSIMO, João (University of Potsdam)

Presenter: VERÍSSIMO, João (University of Potsdam)

Session Classification: Contributed papers 5

Track Classification: Freely Contributed Paper