Diversity and Prediction in Language Processing: Influences of Speaker, Register, and Experimental Method

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Workshop description

Aims and background: Prediction plays a central role in theories of language processing and is assumed to influence both the speed and accuracy of processing. Although there is a lively debate about what form prediction may take (cf. Huettig & Mani 2016, Kuperberg & Jaeger 2016, Pickering & Gambi 2018), there is little work examining the influence of linguistic and experimental diversity on prediction. For a better understanding of prediction, this workshop examines three facets of diversity in language processing:

Intra- and Inter-individual Diversity: Usually explored in coarse group comparisons (e.g., mono- vs. multilingual) or broad cognitive distinctions (e.g., working memory), intra- and inter-individual diversity remains underdescribed and less well understood. How do language users differ in their predictive abilities and strategies, and how are these differences shaped by biological and/or cultural influences?

Stylistic Diversity: Despite calls for more naturalistic stimuli, the majority of language processing research still focuses on a very constrained register of well-controlled sentences composed in the standard language. How are predictions shaped by extra- and meta-linguistic context, such as register/genre or accent/speaker identity?

Methodological Diversity: A wide variety of empirical methods are now available, yet the majority of studies use only one or two. What opportunities and challenges do we face, when integrating multiple approaches to examine linguistic diversity in human's predictive capacity? How much diversity can our methods handle?

Talks: This workshop brings together researchers working on one or more of these facets. *Roel Willems* opens the workshop with an overview of how computational language models and neuroimaging data from the processing of naturalistic stimuli can be combined to further our understanding of prediction in language processing. *Alexandra Engel and Adriana Hanulíková* report on a study that examines the interplay between morphosyntactic predictions and text genre or speaker style, respectively, hence addressing stylistic and intra-individual diversity. They find that readers/listeners are sensitive to genre and speaker style and adjust their morphosyntactic predictions accordingly. *Elma Kerz, Daniel Wiechmann and Stella Neumann* focus on the well-established effect of lexical predictability and how it is influenced by stylistic diversity (language register) and inter-individual diversity in working memory capacity. Their findings from reaction time experiments suggest that word predictability is mediated by both language register and working memory capacity. In their talk, *Kyla McConnell and Alice Blumenthal-Dramé* investigate methodological diversity in pitting corpus-linguistic association scores against psycholinguistic variables for lexical processing cost in a self-paced reading study. They conclude that task effects exert a non-negligible influence on the relationship between cognitive processing correlates and association scores from corpora. *Leigh Fernandez, Paul Engelhardt, Angela G. Patarroyo and Shanley Allen* take a closer look at inter-individual diver-

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sity based on speaker age and language background (L1 vs. L2) and examine the influence of speech rate on anticipatory eye movements in spoken language comprehension. They find that speaker groups are differentially sensitive to speech rate, which impacts on the existence of anticipatory eye movements. *Kate Stone and Sol Lago* further investigate individual variability in the time-course of predictions during spoken language comprehension. They find an earlier onset of anticipatory eye movements in German L1 speakers vs. L2 speakers of German, who were slower and more variable in their effect pattern. *Karen Henrich, Matthias Scharinger and Winfried Menninghaus* investigate stylistic diversity as to whether the predictability of strong and weak syllables in metered speech varies as a function of foot type. They present EEG evidence that predictive processing seems to be enhanced in metered speech, especially if the meter is based on the preferred foot type of the investigated language. *Priscila López-Beltrán and Paola E. Dussias* approach stylistic diversity from a somewhat different perspective, by developing experimental stimuli from corpus tokens to investigate the predictive processing of Spanish subjunctive mood in embedded clauses. Their findings demonstrate the reliability of ecologically valid stimuli and that lexical verb information triggers expectations regarding mood in embedded clauses. Finally, *Anna Laurinavichyute, Anastasiya Lopukhina and Svetlana Malyutina* approach the question of whether readers build sentence representations with a good-enough strategy, including inter-individual diversity based on a varied age sample from adolescence to older age. They found that age groups are susceptible to good-enough processing in sentence comprehension to a different extent.

In sum, the presentations in our workshop provide novel empirical evidence for the variability and diversity inherent in predictions, and how they may modify the quality and time-course of predictions in language processing.

References: Huettig, F. & N. Mani (2016). Is prediction necessary to understand language? Probably not. Language, Cognition and Neuroscience, 31(1), 19–31. Kuperberg, G.R. & T.F. Jaeger (2016). What do we mean by prediction in language comprehension? Language, Cognition and Neuroscience, 31(1), 32–59. Pickering, M.J. & C. Gambi (2018). Predicting while comprehending language: A theory and review. Psychological Bulletin, 144(19), 1002–1044.

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