Reading, phonological awareness, and syntax: Comorbidity in an exemplar-based model of language and reading

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Research topic: Co-development and comorbidity in language processing. The specific research goals and questions are:

1) Accounting for the co-development of syntax as serving discursive functions, categorization abilities, phonological awareness, and reading.

2) Developing an exemplar-based model of phonological representation with regard to reading.

3) Examining the hypothesis that phonological awareness problems are related to deficits in categorization skills, realized as an incomplete exemplar phonological space. Such deficient exemplar-based representations may cause problems in both syntactic productivity and reading abilities.

Why is my study unique? This investigation is motivated by recent advances in data analysis, cognitive science, linguistics, and reading research aiming at (i) embedding a developmental model of reading in current approaches to exemplar-based cognitive representation, and (ii) building a data-driven model that accounts for categorization abilities as a key factor in cognitive development.

Analyses: I developed a syntactic distance measure that accounts for differences and similarities between sentences in a well-defined mathematical manner. I am now applying this measure to the Safra longitudinal data in two ways. First, I have clustered similar picture-description-sentences, yielding clusters of individuals (i.e., children) who behave similarly in terms of syntactic description. These clusters are then examined compared to clusters of individuals formed with regard to success in phonological awareness and categorization tasks. Second, I am grading sentences in a sentence repetition task with respect to distance from a target sentence and examining relations with phonological awareness and categorization tasks. Preliminary results of a mixed effects model show that success in syntactic picture description in kindergarten can be predicted by proximity to the target in the sentence repetition tasks. The next step in this study includes modeling success in 1st grade syntactic and phonological tasks as a function of syntactic and categorization tasks in kindergarten.

Significance of this research and relevance for education: Reading and language are intimately related, and categorization has recently been shown to contribute to the emergence of cognitive representations. Thus, modeling the relations between reading, categorization, phonological awareness, and syntactic performance in early readers is a crucial step for understanding both typical and atypical development, with significant implications for literacy instruction in typical and disabled readers.