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Studying the Mechanisms Underlying Language Processing through the Lens of Individual Differences

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Abstract

The study of individual differences (IDs) in language skills is crucial for understanding the mechanisms underlying language processing. Language use involves tasks such as word production, sentence production, word comprehension, and sentence comprehension, all of which exhibit considerable variability among individuals. This variability is reflected in speech rate, vocabulary, and error patterns, among others. Historically, IDs have been seen as experimental nuisances, but growing recognition now emphasizes the need to describe not only central tendencies in language use but also the variation around them. In this talk, the researcher will present parts of a recent project that aimed to characterize the behavioral, neurobiological, and genetic variability in language skills. Specifically, the author will present a newly developed instrument, the Individual Differences in Language Skills (IDLaS) test battery, comprising 31 tests and capturing eight constructs. The constructs include linguistic experience, processing speed, working memory, nonverbal reasoning, and linguistic processing skills such as word and sentence production and comprehension. The structure of this battery enables the exploration of how domain-specific and domain-general cognitive skills interact in language processing. The researcher will use the second half of the presentation to present a study examining predictors of language production ability. The obtained results show that nonverbal reasoning, processing speed, and linguistic experience significantly influence language production speed—i.e., word, phrase, and sentence production. Notably, linguistic experience benefitted word production (which capitalized on lexical retrieval) more than phrase and sentence production (which capitalized on structure-building). Interestingly, processing speed supported structure building but not lexical retrieval. These findings suggest that language production involves distinct processes for lexical retrieval and syntactic structure building, with different cognitive abilities supporting each. The results challenge lexicalist models of language production, offering more substantial support for hybrid or abstract structural accounts.

Keywords: Individual differences, Language production, Cognitive predictors

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