

UNRAVELING LATENT COGNITIVE PROCESSES

A new approach
for modeling
experimental effects

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In my talk I will present a new approach for analyzing experimental data, focused on discovering the underlying (cognitive) processes and the influence continuous or categorical experimental variables have on these. While conventional regression models (e.g., Generalized linear/additive mixed models; GLMMs & GAMMs) are a popular choice for modeling experimental data, they usually do not account explicitly for these latent processes. Hence, we can only speculate that, for example, an increase in ERP amplitude associated with decreases in word frequency might reflect more effortful lexical retrieval/identification. Instead, I propose to model the effect of experimental variables on properties of the latent (cognitive) processes underlying experimental data directly. As an example of this approach, I will present recent work (Krause et al., 2024, Journal of Cognitive Neuroscience) in which we modeled the effect of frequency on the duration of the processing stages involved in lexical decision (LD) making. I will discuss what we can learn from these models not just about LDs but about cognition in general, how we can potentially make them even better, and potential applications beyond the study of LDs.

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