How to analyze a sample with few data points per participant in a familiarization paradigm in artificial grammar learning?

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Briefly Explain Your Question (max. 100 words)

The study looks at the effect of language complexity on rule learning in an artificial grammar paradigm. I familiarize groups of participants with versions of the same artificial language having different degrees of complexity. Then I test participants using 4 types of language strings, with 5 tokens per type. Thus, I have only 5 answers per condition per participant. The investigated effect is the complexity of the language in the familiarization, thus more test items would add a confound because of unavoidable learning effects in the test phase. How can I work around the few data points in order to still have a reliable statistical analysis?

Scientific field(s) of the author(s)

Psycholinguistics

Relevance to conference theme (max. 50 words)

Finding a workaround for learning effects in the test phase is a widely-spread problem in psycholinguistics research. The difficulty in my project lies in striking the right balance between a low number of test items and enough data points per participant, in order to have a reliable GLMM model.

Keywords (max. 3)

few data points per participant, learning effects, generalized linear mixed effects model