

Delta-tilde interpretation of standard linear mixed model results - DTU Orbit (08/11/2017)

Delta-tilde interpretation of standard linear mixed model results

We utilize the close link between Cohen's d , the effect size in an ANOVA framework, and the Thurstonian (Signal detection) d -prime to suggest better visualizations and interpretations of standard sensory and consumer data mixed model ANOVA results. The basic and straightforward idea is to interpret effects relative to the residual error and to choose the proper effect size measure. For multi-attribute bar plots of F -statistics this amounts, in balanced settings, to a simple transformation of the bar heights to get them transformed into depicting what can be seen as approximately the average pairwise d -primes between products. For extensions of such multi-attribute bar plots into more complex models, similar transformations are suggested and become more important as the transformation depends on the number of observations within factor levels, and hence makes bar heights better comparable for factors with differences in number of levels. For mixed models, where in general the relevant error terms for the fixed effects are not the pure residual error, it is suggested to base the d -prime-like interpretation on the residual error. The methods are illustrated on a multifactorial sensory profile data set and compared to actual d -prime calculations based on Thurstonian regression modeling through the ordinal package. For more challenging cases we offer a generic "plug-in" implementation of a version of the method as part of the R-package SensMixed. We discuss and clarify the bias mechanisms inherently challenging effect size measure estimates in ANOVA settings.

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