

WHAT WOULD FISHER DO? A USEFUL TOOL FOR TEACHING THE MODEL CONSTRUCTION PROCESS

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Students often struggle converting study descriptions into plausible statistical models. What Would Fisher Do (WWFD) first appeared in Stroup (2013) as a tool to motivate the model construction process for generalized linear mixed models. Inspired by Fisher's comments following Yates (1935) "Complex Experiments," WWFD is a technique that organizes the design and treatment structures of the study. The result is a re-envisioned ANOVA table that provides a basis for constructing appropriate models. WWFD aids in understanding the difference between fixed and random effects, the impact of the response variable distribution on the model, and the role of the residual in context of different distributions. Examples of WWFD implementation in both undergraduate and graduate courses in statistical modeling and design of experiments are presented.