Simple Ways to Interpret Effects in Modeling Binary and Ordinal Data

A *seminar* by Alan Agresti

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Probability-based effect measures for models for binary and ordinal response variables can be simpler to interpret than logistic (and probit) regression model parameters and their corresponding effect measures, such as odds ratios. For describing the effect of an explanatory variable while adjusting for others in modeling a binary response, it is sometimes possible to employ the identity and log link functions to generate simple effect measures. When such link functions are inappropriate, one can still construct analogous effect measures from a logistic regression model fit, based on average differences or ratios of the probability modeled or on average instantaneous rates of change for the probability. Simple measures are also proposed for interpreting effects in models for ordinal responses based on applying a link function to cumulative probabilities. The measures are also sometimes applicable with nonlinear predictors, such as in generalized additive models. The methods are illustrated with examples and implemented with R software. Parts of this work were joint with Claudia Tarantola of the University of Pavia and Roberta Varriale of La Sapienza University in Italy, and appeared in "Trends and Challenges in Categorical Data Analysis", edited by Maria Kateri and Irini Moustaki (Springer, 2023).

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