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Enhancing Model Visualization in Statistical Analysis: Introducing the R Package MoPlot

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Abstract

In many statistical analysis methods, interpreting model coefficients solely from the coefficient table can be difficult or counterintuitive (i.e., the coefficient of polynomial contrasts or in generalized additive models). To facilitate understanding, researchers often rely on effect plots. However, most statistical software generates plots that primarily display trends/curve for continuous variables or raw/predicted means for categorical variables, without providin key details such as the contrast types used, effect sizes of each effect, or the information about statistical significance.

We introduce MoPlot, a novel R package designed to address these limitations. By simply inputting a fitted model, MoPlot generates plots for both single and interaction effects while explicitly accounting for the contrast coding scheme applied in the model. The package automatically visualizes planned comparisons, providing a clearer representation of the related categorical predictors. Additionally, it generates comprehensive figure captions detailing the effects displayed, including significance information.

Furthermore, MoPlot includes a "coefficient mode,"allowing users to visualize model coefficients alongside their corresponding effect sizes—a crucial feature for meta-analytic studies. The package supports a wide range of contrast coding schemes available in R, such as treatment, sum, sliding difference, polynomial, Helmert, reverse Helmert, and custom-defined contrasts. Real-world data examples will illustrate how MoPlot enhances interpretability in models with both continuous and categorical predictors.

Finally, we discuss the implications of using MoPlot across various statistical models and highlight its potential contributions to reproducibility and open science. By improving the clarity of effect visualizations, MoPlot provides researchers with a more informative and transparent approach to statistical analysis.

Keywords

Linear Models; Plot; Contrasts; MoPlot

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