Visualizing Lack of Fit in Complex Regression Models: Adding Partial Residuals to Effect Displays

John Fox[1,*], **Sanford Weisberg**[2]

1. McMaster University, Hamilton, Ontario, Canada
2. University of Minnesota, Minneapolis, Minnesota, U.S.A.
*Contact author: jfox@mcmaster.ca

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Effect displays, introduced by Fox [2] for generalized linear models, visualize the response surface of complex regression models by conditioning and slicing the surface, producing a sequence of 2D line graphs representing the response surface. These displays are implemented in the **effects** package for *R* [3, 4].

Partial-residual plots, also called *component-plus-residual plots*, visualize lack of fit, traditionally in relatively simple regression models. The properties of these graphs were systematically explored by Cook [1].

We combine partial residuals with effect displays to visualize lack of fit in complex regression models, plotting residuals from a model around 2D slices of the fitted response surface. Employing Cook's fundamental results, we discuss and illustrate both the strengths and limitations of the resulting graphs.

This extension to effect displays is implemented for generalized linear models of arbitrary complexity in the development version of the **effects** package.

References

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