

# A graphical evaluation of Robust Ridge Regression in mixture experiments

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## Abstract

In mixture experiments, estimation of the parameters is generally based on Ordinary Least Squares (OLS). However, in the presence of multicollinearity and outlier, OLS can result in very poor estimates. In this case, effects due to the combined outlier-multicollinearity problem can be reduced to certain extent by using alternative approaches. One of these approaches is to use biased-robust regression techniques for the estimation of the parameters. In this paper, we suggest the use of robust ridge regression based on M-estimator in the cases where there is multicollinearity and outliers during the analysis of mixture experiments. Also, for selection of biasing parameter, we use a new graphical approach for evaluating the effect of the robust ridge regression estimator with respect to the scaled prediction variance and fraction of design space plots. The suggested graphical approaches are illustrated on hot-melt adhesive data set.

## Keywords

Experiments with mixture, Robust regression, Robust Ridge Regression, Multicollinearity, Scaled prediction variance, Fraction of design space plot.

## References

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