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Robustness of statistical , Regression analysis, Statistical quality control

Although the insertion of product terms into analytical model to test for presence of interaction effect is very common in economic, social and health sciences, it has long been criticized for that existence of interaction is model dependent (Greenland (2009) and Mauderly and Samet (2009)). The efforts for resolving this criticism leads to multiple but ambiguous definitions of statistical interaction resulting in assessing various but unknown versions of effect (Greenland (2009)). We report that a systematic introduction of definitions, methods and theorems to fit the intercorrelation (association) parameter into the regression model brings interesting advantages: (a) This approach allows us to define and measure a clean effect of intercorrelation for statistical inferences of unknown statistical interaction. (b) Statistical inferences for statistical interaction all can be constructed from the estimation theory of the distributional parameters. (c) This regression model measures an unambiguous but also model independent effect of intercorrelation that avoids the controversy of insertion.