Headline

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I would use robust statistical methods because they are more resistant to small deviations from the assumptions, in other words robust with respect to outliers and stable with respect to small deviations from the assumed parametric model. It is well known that classical methods behave quite poorly under slight violations of the strict model assumptions. In particular, least squares estimate for regression models are highly sensitive to outliers. If the outlier results from non-normal measurement error or some other violation of standard ordinary least squares assumptions, then it compromises the validity of the regression results if a non-robust regression technique is used. Another instance in which robust estimates should be used is when there is a suspicion of heteroscedasticity.

It is discouraged to screen the data, to remove outliers and then to apply classical inferential methods. This is not a simple and good way to proceed. In multivariate or highly structured data, it can be hard to single out outliers or to identify influential points. In place of rejecting an observation, it could be better to down-weight uncertain observations. Rejecting outliers reduces the sample size, could affect the distribution theory, and variances could be underestimated from the cleaned data.

I would use robust methods to compliment and to compare to the classical methods. If they give about the same results, I would use the classical method because it is easier to explain to someone not familiar with statistics. However, if the robust method gives a more accurate result, I would definitely use it.