Bias

Bootstrap estimator

Better bootstrap estimator

Jackknife estimator

Accuracy and Bias

SE($\hat{\theta}$) used as a measure of accuracy for the estimator $\hat{\theta}$.

Larger SE's mean less accuracy.

An alternative measure is bias, where bias = E($\hat{\theta}$) - θ

Large bias, like large standard error, is not desirable.

Unbiased estimators "... promote a nice feeling of scientific objectivity".

(Efron & Tibshirani, 1993, p. 125)

Estimating Bias

Estimating the amount of bias for a given statistic can be useful.

In Monte Carlo studies comparing different modeling or statistical approaches, bias is often computed as well as RMSE (depending on the study).

Bootstrap and jackknife methods can also be used to estimate bias.