Efficiency and Robustness Properties of Gini's mean difference

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The talk is based on joint work with Carina Gerstenberger.

There has been a long debate in the statistics literature, sometimes referred to as the Eddington-Fisher debate, of whether the standard deviation or the mean deviation is to be preferred as a scale measure. The first round was certainly won by the standard deviation, having R. A. Fisher on its side. Later, J. W. Tukey took a stand for the mean deviation. In this talk, we want to introduce the mean of pairwise differences, commonly referred to as Gini's mean difference, into this debate and will argue that it should be regarded as a consensus rather than a compromise. We compare the efficiency and robustness properties of the three estimators. Our findings may be summarized by saying Gini's mean difference combines the advantages of the other two.

We will further investigate the finite-sample properties of several popular scale measures by means of simulations. Also, applications of the various scale measures to change-point tests for dependent data will be briefly outlined.