ON MAD AND COMEDIANS

MICHAEL FALK

Mathematisch-Geographische Fakultät, Katholische Universität Eichstätt, Ostenstrasse 26–28, D-85071 Eichstätt, Germany

(Received March 8, 1996; revised October 15, 1996)

Abstract. A popular robust measure of dispersion of a random variable (rv) X is the *median absolute deviation from the median* $\mathrm{med}(|X - \mathrm{med}(X)|)$, MAD for short, which is based on the median $\mathrm{med}(X)$ of X. By choosing $Y = X$, the MAD turns out to be a special case of the *comedian* $\mathrm{med}((X - \mathrm{med}(X))(Y - \mathrm{med}(Y)))$, which is a robust measure of covariance between rvs X and Y. We investigate the comedian in detail, in particular in the normal case, and establish strong consistency and asymptotic normality of empirical counterparts. This leads to a robust competitor of the coefficient of correlation as an asymptotic level-α-statistic for testing independence of X and Y. An example shows the weird fact that knowledge of the population $\mathrm{med}(X)$ does not necessarily pay (in the sense of asymptotic relative efficiency) when estimating the MAD.

Key words and phrases: Median absolute deviation from the median, robust measure of correlation, comedian, breakdown point, covariance, correlation coefficient, bivariate normal vectors, strong consistency, asymptotic normality.