of the bootstrap estimate of variance to the asymptotic variance. Nor does weak convergence to normality of the empirical distribution of the centered pseudovalues guarantee corresponding convergence of the jackknife estimate of variance. The situation begs for robustification—replacement of the variance functional by a scale equivariant functional that equals variance at normal distributions, but is weakly continuous there while retaining high asymptotic efficiency. One possibility is a standardized trimmed variance.

A similar argument exists for replacing the mean functional by a symmetrically trimmed mean (say) in bootstrap and jackknife estimates of bias.

REFERENCES

ABRAMOVITCH, L. and SINGH, K. (1985). Edgeworth corrected pivotal statistics and the bootstrap. *Ann. Statist.* **13** 116–132.

BERAN, R. (1984). Jackknife approximations to bootstrap estimates. *Ann. Statist.* **12** 101–118.

BERAN, R. and MILLAR, P. W. (1985). Asymptotic theory of confidence sets. In *Proceedings of the Berkeley Conference in Honor of Jerzy Neyman and Jack Kiefer* (L. M. Le Cam and R. A. Olshen, eds.). Wadsworth, Monterey, Calif.

FREEDMAN, D. A. (1981). Bootstrapping regression models. *Ann. Statist.* **9** 1218–1228.

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Professor Wu is to be congratulated on a very interesting paper that advances our knowledge of jackknife methods and illustrates some problems of heteroscedastic data. Of course, Professor Wu's paper does not demonstrate a superiority of the jackknife over the bootstrap and is not intended as such. The bootstrap is a more general method. The bootstrap philosophy is to estimate the probability distribution of the data as accurately as possible and then find or approximate the sampling distribution of the relevant statistic under this estimated distribution. We agree with this philosophy. The present paper does a great service in underscoring the need for care about assumptions, both in this specific case and in statistics in general.

The robustness of the jackknife variance estimator to nonconstant variance is an interesting and potentially useful property, but what is its real importance for statistical practice? To answer this question we need to ask, "What types of heteroscedasticity can we expect in practice and what should be done about

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