

Weighting observations based on uncertain standard error estimates

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Abstract

It is well-known that power of tests and precision of estimation can be optimized by weighting each observation by the reciprocal of its variance. In practice, however, such variances are rarely known but in some situations, estimates of the variances can be obtained, e.g., using a bootstrap algorithm. But if there is a lot of uncertainty in the variance estimates, does it still help to weight the observations by these imprecise estimates?

Illustrating using data from a PET imaging study, I will describe some of the various approaches I've taken to this problem recently. My main purpose is to open an informal dialog in which I will appeal to the collective wisdom and experience of the biostatisticians and other researchers at PI, hoping that we can reach a consensus as to the best general approach to take in such situations.

Biographical Note

Dr. R. Todd Ogden has interests in a wide variety of topics in both statistical methodology and various application areas. He is currently collaborating with researchers at the New York State Psychiatric Institute on various statistical modeling issues with the analysis of data from brain imaging studies. Other ongoing interests include functional data analysis, nonparametric regression, wavelet methods, statistical modeling, statistical computing, and statistical education.

¹ The PI Biostatistics Seminar Series is held on Tuesdays at New York State Psychiatric Institute. If you are interested in receiving regular announcements for our seminars in the future, or if you need further information, please contact Jina James (jamesji@nyspi.columbia.edu, (212) 543-5589).