

EMPIRICAL BAYES: A FREQUENCY-BAYES COMPROMISE

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Empirical Bayes research has expanded significantly since the ground-breaking paper (1956) of Herbert Robbins, and its province currently incorporates a range of methods in statistics. For example, Stein's famous estimator (James and Stein, 1961) is now best understood from the parametric empirical Bayes viewpoint. Appropriate generalizations and applications of Stein's rule in other settings (Efron and Morris, 1973, 1975; Morris, 1983b) are facilitated dramatically by the empirical Bayes viewpoint, relative to the frequentist perspective -- this will be indicated below.

Parametric empirical Bayes models differ from those considered in early empirical Bayes work, which focused on consistent estimation of Bayes rules for general prior distributions, allowing the number of parameters, k , to become asymptotically large. Rather, Stein's estimator and the generalizations developed by Efron and Morris take k fixed and possibly quite small, and ask for uniform improvement on standard estimators.

A series of examples are offered below to illustrate how empirical Bayes modeling is properly seen as a compromise between frequentist modeling and Bayesian modeling, and how the empirical Bayes model permits extension of various concepts, such as minimax properties and confidence regions, to more

*Research was supported by NSF Grant No. DMS-8407876, Department of Mathematics and Center for Statistical Sciences, University of Texas, Austin 78712.
AMS 1980 subject classifications: Primary 62C12; Secondary 62C10.

Key words: Parametric Empirical Bayes, Empirical Bayes Minimax, Empirical Bayes Confidence Intervals.