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Discussion of "Calibrated Bayes, for Statistics in General, and Missing Data in Particular" by R. J. A. Little

Nathaniel Schenker

It is a pleasure and an honor for me to comment on this article by Rod Little, who has contributed greatly to statistics in general and to Bayesian statistics and handling missing data in particular. Little provides a nice discussion of the calibrated Bayes approach, methods for missing-data problems and recent developments (SRMI and PSPP) that increase flexibility in dealing with missing data.

1. DON'T FORGET THE PRAGMATISTS

Little begins his Section 2 by stating that the statistics world is still largely divided into frequentists and Bayesians. Indeed, during the University of Maryland workshop ("Bayesian Methods that Frequentists Should Know") at which Little presented a talk on the topic of his article, many of the speakers declared themselves to be either frequentists or Bayesians. As formal discussant of Little's talk, however, I declared myself to be a "pragmatist," which Little (2006) defined as one who does not have an overarching philosophy and picks and chooses what seems to work for the problem at hand. If I were forced to choose a philosophy, I would probably go with the Bayesian one. But I am happy to use either approach, depending on the context, and many of my statistical colleagues seem willing to use either approach as well. Moreover, although subject-matter specialists with whom I work seem to be primarily familiar with point estimates, standard errors and confidence intervals, they seem to have no problems using Bayesian analogues (e.g., posterior means, standard deviations and credibility intervals) in the same way, when presented with them.

Little (2006) argued that, to enhance the credibility of our profession and avoid confusion and ambiguity, it would be preferable not to have the "split personality" that is inherent in the pragmatic approach. He has made a strong case in that article and here for calibrated Bayes as a unified inferential approach that combines strengths of the Bayesian and frequentist approaches. His arguments are compelling, but given the abundance of good and easily accessible frequentist methods that exist and are widely used, I imagine that it would be difficult for our profession to rid itself of this split personality. Moreover, I think the key issue in most applications is the development of realistic models for the data. Thus, I second Little's emphasis on flexible models and methods, such as the SRMI and PSPP methods, and his concluding call for further work on model diagnostics, especially in the area of missing data.

2. THE FREQUENTIST/BAYESIAN SCHISM IS PERHAPS MAGNIFIED IN SURVEY SAMPLING

In the survey sampling world in which I primarily work as a government statistician, the definition of being a frequentist versus being a Bayesian is not necessarily clear, because inferences are often desired about finite-population quantities rather than about model parameters. Such inferences are often made using a design-based paradigm (e.g., Cochran, 1977), that is, based on the distribution of estimators in repeated sampling from the finite population under a given design. Thus, one possible definition of frequentist inference in survey sampling is that it treats the finite-population values, Y, as fixed parameters, and bases inferences about a function of those parameters, say, $Q(Y)$, on a function of the sampled values and its distribution in repeated sampling. The corresponding definition of Bayesian inference (e.g., Rubin, 1987, Chapter 2) is that it places a prior distribution on Y, say, $p(Y|\theta)$, where θ represents hyperparameters with a hyperprior $p(\theta)$, and bases inferences on the posterior predictive distribution of $Q(Y)$ given the sampled values.

The two-by-two table (Table 1) gives a simplified, nonexhaustive depiction of the frequentist/Bayesian dichotomy within survey sampling on the one hand and

Nathaniel Schenker is Associate Director for Research and Methodology, National Center for Health Statistics, Centers for Disease Control and Prevention, 3311 Toledo Road, Hyattsville, Maryland 20782, USA (e-mail: nschenker@cdc.gov)