

possible, and discuss data collection procedures and analytic techniques vis-à-vis their pertinence to the research objectives and to logistical circumstances. On the other hand, it is essential that the statistical consultant be familiar with the substance of psychiatric theory and practice and possess pertinent interpersonal communication skills.

A topic related to the latter is the teaching of statistics for the psychiatrist, a need well emphasized and examined by Everitt. Additionally, it would seem advisable to consider, from a content stand point, discussion of methods for formalizing and quantifying psychiatric concepts as well as of the value and limitations of various data collection strategies. More generally, didactic effectiveness may be enhanced by integrating this teaching of statistics within the context of educational programs on research design and methodology, and by emphasizing practical and thoughtfully supervised exercises with actual research cases.

#### ADDITIONAL REFERENCES

BAYARRI, M. J. and DEGROOT, M. H. (1986). Bayesian analysis of selection models. Technical Report No. 365, Dept. Statistics, Carnegie Mellon Univ.

- BRYK, A. S. and RAUDENBUSH, S. W. (1987). Application of hierarchical linear models to assessing change. *Psychol. Bull.* **101** 147-158.
- FLEISS, J. L., WILLIAMS, J. B. W. and DURBO, A. F. (1986). The logistic regression analysis of psychiatric data. *J. Psychiatric Res.* **20** 195-209.
- GULBINAT, W. (1983). Mental health problem assessment and information support: Directions of WHO's work. *World Health Stat.* **36** 224-232.
- KRAMER M. and ANTHONY, J. (1983). Review of differences in mental health indicators used in national publications: Recommendations for their standardization. *World Health Stat.* **36** 256-338.
- MEZZICH, J. E., DOW, J. T., GANGULI, R., MUNETZ, M. R. and ZETTLER-SEGAL, M. (1986). Computerized initial and discharge evaluations. In *Clinical Care and Information Systems in Psychiatry* (J. E. Mezzich, ed.). American Psychiatric Press, Washington, D.C.
- MORRIS, C. N. (1983). Parametric empirical Bayes inference: Theory and applications. *J. Amer. Statist. Assoc.* **78** 47-65.
- PARCHAPPE, J. B. M. (1839). *Recherches Statistiques sur les Causes de l'Aliénation Mentale*. Imprimerie de D. Briere, Rouen.
- ROSENTHAL, R. (1979). The "file drawer problem" and tolerance for null results. *Psychol. Bull.* **86** 638-641.
- STRAUSS, J. S., HAFEZ, J., LIEBERMAN, P. and HARDING, C. M. (1985). The course of psychiatric disorder. III. Longitudinal principles. *Amer. J. Psychiatry* **142** 289-296.
- TEN HORN, S., GIEL, R., GULBINAT, W. and HENDERSON, J., eds. (1986). *Psychiatric Case Registers*. Elsevier, Amsterdam.

## Comment

Joel B. Greenhouse

Professor Everitt argues that statisticians can and will play a major role in the development and advancement of psychiatric research. By developing close working relationships with investigators in psychiatry, I have found that there are several levels of involvement where a statistician can make important contributions. On the most basic level, and because "psychiatry is a relatively young science," this relationship will often begin with helping an investigator to carefully articulate a set of research questions, including discussions of what kind of data are available or need to be collected to answer these questions, or whether the questions can be answered at all. Of course, this includes developing protocols which will answer these questions. This activity could formally fall under the heading of the principles of experimental design, but as Professor Everitt has suggested, experimental design in the broader sense of including

how to think about and do research, with a strong emphasis on the principles of the philosophy of science. For the statistician, it is an activity which is often time consuming, and, since it may not yield a tangible product, may be difficult to document professionally. Sometimes, in the early stages of an investigation, it results in a fundable grant proposal with the statistician listed as a consultant or even as a co-investigator. More often than not, it results in a psychiatrist who thinks more clearly about research and recognizes and appreciates the collaborative role of a statistician.

By far, the most exciting aspects of consulting in psychiatry are encountering new problems, unique to psychiatric research, that lead to interesting statistical and methodological research. Professor Everitt discusses two examples of the use of Cox's proportional hazards model to problems in psychiatry. Although no new problems are discussed here, the application of this methodology clearly was superior to the initial analyses considered and contributed to a deeper understanding of the problems. It is interesting to note that although a standard methodological tool in other

---

*Joel B. Greenhouse is Assistant Professor of Statistics, Department of Statistics, Carnegie Mellon University, Pittsburgh, Pennsylvania 15213.*