## Introduction to Special Section

Akaike's information criterion (AIC) is a useful statistic for statistical model identification and evaluation. This criterion was developed by Akaike some fifteen years ago. Since its introduction, voluminous papers have been published in various journals, proceedings, and monographs, dealing with both theoretical and empirical aspects of this *information-theoretic* procedure. In recent years this journal has had opportunities to publish several such papers, reflecting the importance of this criterion in psychometric research.

One of the main advantages of AIC lies in its simplicity which does not require any table lookup. There is no problem of subjectively specifying an arbitrary significance level to test the models, and comparisons are not restricted to two models which are nested or hierarchically ordered. It is easy to calculate AIC once the maximum likelihood estimators of the parameters of a model is determined. A model with a minimum value of AIC is chosen to be the best fitting model among several competing models. The minimum AIC procedure requires considerable expertise in data analysis on the part of the researcher. There are a number of conceivable reasons why a particular model happens to be chosen as the best fitting model. If we are only satisfied with the chosen model and do not go further to look into "why," we will be missing the most important aspect of data analysis. In particular, it is important to find out why the other models are not chosen according to the minimum AIC criterion. In this respect, AIC emphasizes the goodness of modeling.

Another important aspect is to realize that AIC is not intended to identify a true model. The best fitting model does *not* mean the true model. Rather it means that the model is best among competing models in the sense that it gives the closest approximation to the true model or reality. Naturally, the best fitting model could change as a function of the sample size, since with a larger sample size parameters of a model can be estimated more reliably. For example, in the factor-analytic context, an appropriate question might be not what the number of correct factors is, but how many factors can be reliably extracted given the data set at hand.

In view of the importance of AIC in psychometric research Yoshio Takane, as Chairman of the Program Committee, invited Professor Hirotugu Akaike, Director General of the Institute of Statistical Mathematics, Tokyo, Japan, to the 1986 Annual Meeting of the Psychometric Society in Toronto as our guest speaker. Taking advantage of Professor Akaike's visit, a special symposium on "Statistical Modeling and Model Evaluation" was organized and chaired by Hamparsum Bozdogan, where several AIC related papers were presented. The following special section includes Akaike's invited paper as well as selected papers presented in this symposium. This has been brought about with the recognition that the information conveyed at the Annual Meeting should be made available to all members of the Psychometric Society.

We thank Ivo Molenaar for giving us the opportunity to put those papers in this volume. We thank the authors making their papers available for this purpose for all the readers, and we thank Jim Ramsay and other referees who reviewed all these papers. Without their help this special section would not have been possible.

April 14, 1987

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https://doi.org/10.1007/BF02294358 Published online by Cambridge University Press