H. Rouanet & al., "New ways in statistical methodology", Bern, Peter Lang: European University Studies, Series 6, Psychology, vol. 618, 1998, 276 p.

*H. Rouanet & al., "New ways in statistical methodology", Bern, Peter Lang:
European University Studies, Series 6, Psychology, vol. 618, 1998, 276 p.*

Judith Rousseau

BIBLIOGRAPHIE CRITIQUE

Henry ROUANET et al., *New ways in statistical methodology*, Bern, Peter Lang!: European University Studies: Series 6, Psychology, vol. 618, 1998, 276 p.

New ways in statistical methodology is addressed essentially to researchers. In the first chapters, the authors describe and analyze thoroughly the problems encountered by researchers using statistical procedures, emphasizing on tests. Indeed the understanding (or the interpretation) of the language of significance, as they call it, is far from being obvious. What are the typical difficulties researchers have to face!? The authors are interested mainly in three aspects of statistical practices!: the essential non-symmetry between the null hypothesis and the alternative, the assumption of randomness made on the sample, the interpretability of the classical tests. As it is, researchers essentially use classical methods such as p-values or fixed significance levels. Such methods induce a non-symmetry in the test procedure in the following way!: a p-value indicates the error one would make by rejecting the null hypothesis whereas it is true. Thus a significant result (the p-value is low) really contradicts the null hypothesis, since the probability of being wrong, given by the p-value, is low. However a non significant result (the p-value is not low) only tells you that would you reject the null hypothesis, the probability of being wrong would not be too low. It is obviously not equivalent to saying that the probability of uncorrectly accepting the null hypothesis is low. Actually the first and the third aspects quoted above are connected to each other since this non-symmetry can make the interpretation quite awkward, and this is not the only difficulty encountered by researchers using classical procedures.

Their study of the use of classical procedures by researchers is careful and well illustrated by examples that are both simple and pertinent. Thus they prove that classical methods for testing can be inadequate in practice.

To answer these questions the authors propose Bayesian methods. Their argumentation in proving that Bayesian methods do not suffer from the above drawbacks is convincing. It would be too long to summarize their argument, however note that by calculating the probabilities of both hypothesis (the null and the alternative) bayesian procedures provide a way to compare them directly. To illustrate their argument the authors study in detail categorized data, which are common in behavioral, social and medical sciences.

To answer the problem of randomness of the sample the author propose a method called combinatorial inference, which is interesting as a first step in the analysis of data, when the size of the population is not too large.

On the whole, the book should have a large audience, and hopefully would convince researchers of the interest of bayesian methods in practice, since it exposes clearly the principles of the bayesian approach, without getting into too technical and theoretical details. It also provides a reflection on the way to teach or to introduce applied statistics.

Judith ROUSSEAU
UFR Biomédicale – Université René Descartes