

## Book Review

Understanding Experimental Design and Interpretation in Pharmaceutics

by N.A. Armstrong and K.C. James

Prentice-Hall, Simon & Schuster International Group, Hemel Hempstead, U.K., 1990, 184 pp.; ISBN 0-13-293-465-5.

Price £39.95 (hardback); £14.95 (paperback).

This book has the stated objective of "adopting a tutorial and guided self-learning approach" to studies in experimental design and optimisation. My own background is probably not atypical of the targetted readership of this work, in that I studied statistics to O-level standard at school, and have subsequently used calculators, and more recently computer programs, to utilise a limited selection of statistical techniques (usually linear regression, standard deviation, and on occasions factorial design and *t*-tests). Consequently, I was happy to read this book in the hope that it would stimulate my interest in statistics and increase my existing repertoire.

The content of the book is comprehensive, and is littered with useful and interesting pharmaceutical examples. Chapter 1 consists of a brief introduction to experimental design, which is always useful. Chapter 2 covers comparisons of means (*t*-test, two-way analysis of variance and standard deviation); for me this was familiar ground and I could follow the text with ease. Further chapters were devoted to non-parametric treatments, factorial design of experiments, correlation and regression (linear, non-linear, etc.), multivariate analysis and optimisation. These sections were not always easy to follow, a situation that was not helped by the fact that figures were often a number of pages away from where they were described in the text (due to the sheer number of figures that are used). The final section provides some computer programs (BASIC and MINITAB) which may prove useful to users who do not have access to high-quality commercial software.

I have to question whether the book used a 'tutorial and self-learning approach'. It was in all

respects very similar to those undergraduate days when you missed a lecture and copied the notes from a friend; the friend was always well selected as a good note-taker, however, when you tried to revise from these notes it always seemed that, despite all the information being there and being well laid out, one had the feeling of not getting the full story and not really obtaining a working understanding of the subject. It has been many years since I have had this feeling, but somehow when I read this book it is like reading someone else's lecture notes. As in the lecture note analogy, the authors are indeed well qualified for the task, and the content of the book is comprehensive; the reader's level of understanding is inevitably increased, but to what extent?

In an attempt to ascertain whether there was a failing in my own abilities to understand, I consulted a similar text (*Pharmaceutical Statistics* by Stanford Bolton, Marcel Dekker, New York, 1984). In general, I found that the older volume was easier to follow. My conclusion is that this book is well intentioned, but of little value to the experienced statistician and perhaps not the easiest book to follow for the novice. However, the subject matter is important as statistical analysis is not used adequately in the field of pharmaceutics and, therefore, any attempt to raise its profile is to be encouraged.

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