

HOW TO ANALYSE YOUR REPEATED MEASURES DATA

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INTRODUCTION

A fundamental assumption in many statistical models is that the observations are independent. However, in studies involving repeated measurement of the same variable on each experimental unit (on different occasions or under different conditions, for example) this assumption is unlikely to hold: observations on the same experimental unit are likely to be correlated. Data sets with this kind of structure are remarkably ubiquitous, arising in a broad range of disciplines. For this reason, especially in recent years, a great deal of research effort has been made in developing statistical techniques permitting the effective and valid analysis of such data. Moreover, because of the diversity of the different origins of such data, many different approaches to their analysis have been developed.

This presents the researcher with a problem of choice: which of the various methods are best suited to the data and research issues at hand?

It is this question which is the motivating force behind this review - Instead of a simple technical catalogue of the various methods, we have attempted to identify the important factors in determining appropriate choice of technique and then to describe methods of analysis with emphasis on these factors. For reasons of space we have restricted the discussion to the most popular methods and only to 'measured' on 'continuous' data. For similar reasons the descriptions are necessarily rather superficial. For more detail and numerical examples see Crowder and Hand (1990).

The body of this paper falls into two parts: first the discussion of the factors and second the descriptions of methods.

FACTORS INFLUENCING CHOICE OF METHOD

THE RESEARCH OBJECTIVE

It seems almost fatuous to state it, but choice of method is critically determined by the research question. Careful consideration must be given to