

### Book Review

#### The Science of Observational Methods

A review of Paul Martin and Patrick Bateson, *Measuring Behaviour: An Introductory Guide* (3<sup>rd</sup> ed.). Cambridge University Press, Cambridge, 2007, 176 pp., US\$45.00, ISBN 978-0521535632 (paperback).

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Paul Martin and Patrick Bateson have updated their guide to behavioral biology, and it continues to be a gem. In a mere 176 pages, they manage to address critical topics in the design and execution of a behavioral study. Obviously, some details are left to the reader, but *Measuring Behaviour* provides good resources for those requiring additional information. Most importantly, they hit the key ingredients of a well thought-out behavioral study; their little book will be sufficient for many undergraduates engaged in studies for coursework, or those learning the fundamentals of behavioral science. Although intended primarily for research in animal behavior, *Measuring Behaviour* will also be useful for evolutionary psychologists studying *Homo sapiens* in any “natural” setting. It can serve as an excellent introduction to the design of behavioral projects for graduate students, too, and I have found it a handy reference, as well, for professionals actively engaged in any of the behavioral sciences.

In chapter one, the authors introduce Tinbergen’s four problems of behavioral biology, discuss the study of behavior from the perspectives of psychology and ethology, and suggest why behavior is an essential part of biology. Chapter two focuses on the contemplation required before a study is designed, including how to choose the level of analysis, the species and site of observation, and time of day. The bulk of the book then turns to the nuts and bolts of designing a behavioral research study (chapters 3-8). Defining your research question, the importance of preliminary observation, developing an ethogram and determining what measures to use (latency, frequency, duration, and intensity) are all covered in the “getting started” chapter (3). Chapter 4 is a short commentary on measuring the behavior of individuals versus groups, and how individuals and groups are distinguished. The next two chapters (5 & 6) address the classic sampling techniques (recording methods) and the mediums available, such as data sheets and event recorders. Research methods and experimental design are the focus of chapters 7 and 8, which address such issues as validity and reliability, as well as independence of data points and pseudo-replication. The last three chapters give the student of behavior a quick reference guide to basic statistics for data analysis (chapter 9), more sophisticated analyses of specialized data such as sequences or bouts (chapter 10), and how to interpret and present results (in chapter 11).

Those looking for a comprehensive text on the design of behavioral studies will be disappointed, and should probably consult Lehner's (1996) *Handbook of Ethological Methods* for more detailed commentary on behavioral methodology. For example, there is a brief discussion of the techniques of longitudinal and cross-sectional designs in studying the ontogeny of behavior, and although the concept of cross-sequential design is mentioned, the term is not used. However, the authors did not attempt to cover everything, and they admit this openly. Nevertheless, Martin and Bateson still managed to address a surprising number of important details, at least in brief. For example, they discuss some fairly sophisticated topics related to behavioral biology, such as the importance of power analyses for funding agencies and animal care and use regulations, the common error of using parametric statistical tests when their assumptions are not met, and more complicated statistical analyses such as factor analysis and discriminate function analysis.

This new edition highlights techniques used in modern research such as robotic or computer-generated animals used as stimuli, and interdisciplinary work such as that relating to the effect of the major histocompatibility complex (MHC) in female choice. Finally, it includes a section on presenting one's results and the relationship between science and the public interest. My library holds copies of this text in its 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> editions, and the new one will continue to be of great use to me in my work and in my teaching of undergraduates engaged in research and laboratory coursework. This guide is practically a requirement on the shelves of any behavioral scientist, and is an extremely useful book for teaching the basics of designing a behavioral study to undergraduates and new graduate students.

## **Reference**

Lehner, P.N. (1996). *Handbook of ethological methods* (2<sup>nd</sup> ed.). Cambridge: Cambridge University Press.