BEHAVIOR

QUANTIFYING BEHAVIOR THE *JWATCHER* WAY.
By Daniel T Blumstein and Janice C Daniel. Sunderland (Massachusetts): Sinauer Associates. $19.95 (paper). x + 211 p; ill.; index. ISBN: 978-0-87893-047-0. 2007.

Quantitative methods are used to measure the behavior of species ranging from slime molds to humans. Many employ alphabetical or numeric codes to represent operationally defined behaviors. Codes are entered into data collection devices while observing real time, video, or audio recorded activities. Most contemporary methods yield measurement of overall frequencies, durations, proportions, and rates, as well as sequential dependencies among behaviors.

JWatcher is a complete system for observation using focal individual sampling—scoring a single individual in interaction with others and with aspects of the environment. The software includes operations for defining codes, capturing real time or recorded data, checking for accuracy and reliability, redefining or combining codes, and summarizing results. In addition to overall summaries, the system can study sequential relationships using transition probabilities and lag or Markovian analyses. Methodology for handling truncated sessions due to arbitrary start and end points or out-of-site intervals is especially impressive.

JWatcher comes with a manual and CD-ROM. The program runs on either Windows or Macintosh machines with a Java addition. Data collection using a Palm handheld device is also available. I loaded and used the Windows version with no problems. The authors do warn that the Macintosh version may not deliver full utility. The manual has an excellent introduction to observational methodology and comprehensible instructions for program use. The menu-driven system is easy to learn, although applying some functions may seem tedious in details and time to setup data collection. However, following the instructions will save observation novices a number of headaches later.

One problem is that there is no method for combining sessions for overall summaries. To do this, each session must be summarized, then combined for analysis using another system. This is especially problematic for sequence studies, which usually require long behavior strings for valid analyses. Another problem concerns observer reliability analysis. *JWatcher* does not consider synchrony failure, when two behavior streams mismatch due to missing a behavior—called an omission error. This requires using a time or event window for matching occurrences between streams, but this software has no provision for this typical situation. To adjust for omission errors, the data will need to be edited by hand or a specially written program.

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HUMAN BIOLOGY & HEALTH

HUMAN RESPIRATION: ANATOMY AND PHYSIOLOGY, MATHEMATICAL MODELING, NUMERICAL SIMULATION AND APPLICATIONS.
By V Kulish. Southampton (United Kingdom) and Billerica (Maryland): WIT Press. $150.00. xv + 218 p; ill.; no index. ISBN: 1-85312-944-5. 2006.

This new book has the potential to fulfill a timely, important need as an update on bioengineering and mathematical modeling approaches to respiratory physiology for researchers and students. Unfortunately, it fails because the innovative and interesting new ideas are overshadowed by errors in fundamental equations, chapters that are essentially primary research reports that have not been peer reviewed, mathematical models of situations that have very questionable physiological significance, and a general disconnect between most of the volume and current views and practices in pulmonary medicine. Even the opening table on nomenclature uses an entirely different system for symbols than the well-defined and referenced system that has been established for respiratory physiology.

The book begins with an excellent introductory chapter on the anatomy and physiology of the respiratory system. It is innovative in presenting dynamic aspects of respiratory mechanics first, and then derives the static properties. The next two chapters develop the equations for analysis of gas exchange, but there are several mistakes in equations and some figures are seriously outdated. For example, oxygen consumption, which is the most basic process in respiration, is defined incorrectly on page 78, and Figure 4 in Chapter 2 is an inexcusably poor picture of the alveolar blood-gas barrier considering the beautiful electron micrographs that have been published in textbooks since the 1970s. Chapter 2 develops a model of the effects of foreign particles on diffusing capacity, but significant effects only occur when the lungs would be clogged, so it would be meaningless to measure diffusing capacity. Chapters 8 and 9 are primary research papers that have not been peer reviewed. Chapter 6 proposes a model for quantifying physiological responses to toxic substances based