Measuring Stress in Humans

The purpose of this book is to present state-of-the-art non-invasive methods of measuring the biological responses to psychosocial stress in non-laboratory (field) settings. Following the pathways of Seyle's General Adaptation Syndrome, the text first describes how to assess the psychosocial stressors of everyday life and then outline how to measure the psychological, behavioral, neurohumeral, physiological and immunological responses to them. The book concludes with practical information on assessing special populations, analyzing the often complicated data that are collected in field stress studies and the ethical treatment of human subjects in stress studies. It is intended to be a practical guide for developing and conducting psychophysiological stress research in human biology. This book will assist students and professionals in designing field studies of stress.

Gillian H. Ice is Associate Professor in the Department of Social Medicine at Ohio University of Osteopathic Medicine.

Gary D. James is Director of the Institute for Primary and Preventative Health Care, and Professor of Nursing and Anthropology at Binghamton University.
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Measuring Stress in Humans
A Practical Guide for the Field

EDITED BY

GILLIAN H. ICE
Department of Social Medicine
Ohio University of Osteopathic Medicine

and

GARY D. JAMES
Institute for Primary and Preventative Health Care and
Decker School of Nursing
Binghamton University
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Contributors

Dan E. Brown
Department of Anthropology, University of Hawaii at Hilo, 200 W Kawili Street, Hilo, HI 96720-4091

William W. Dressler
Department of Anthropology, PO Box 870210, University of Alabama, Tuscaloosa, AL 35487-0210

Gillian H. Ice
Assistant Professor, Department of Social Medicine and Director of International Programs, Ohio University College of Osteopathic Medicine, 309 Grosvenor Hall, Athens, OH 45701

Gary D. James
Decker School of Nursing, Binghamton University, SUNY, Academic B, Room 326, Binghamton, NY 13902-6000

Tessa M. Pollard
University of Durham, 43 Old Elvet, Durham DH1 3HN, UK

Thomas W. McDade
Department of Anthropology, Northwestern University, 1810 Hinman Avenue, Evanston, IL 60202

Sharon R. Williams
2711 W Ridgeland Avenue, Waukegan, IL 60085
Foreword

Stress has been recognized as an important psycho-physiological state since the pioneering work of Hans Selye. But until quite recently it has mainly been perceived in humans as a condition generated by extreme and hostile environments such as going into battle, hospital or academic examinations. Increasingly, however, it has been identified as being a consequence of many aspects of lifestyle and the events of everyday living and that, to varying degrees, large numbers of people experience it. Indeed, from the point of view of long-term health, low-level frequent chronic stress is likely to be much more important than occasional acute episodes.

Chronic stress can hardly be studied by experimental procedures in the laboratory. It clearly needs a population approach with investigators monitoring people in the “field” as they go about their daily business. Psychologists have gained important insights by the design of questionnaires which can be applied not only to particular groups undertaking activities which are deemed to be stressful, such as air traffic controllers, but also to whole populations, experiencing a diversity of lifestyles. They have identified various elements, particularly in occupational situations, which aggravate stress, as for example absence of job control, but questionnaires are of little use outside one’s own language, or at least culture. They also have questionable validity in the study of children.

For these wider studies it is necessary, or at least desirable, to have some physiological measures of the stressed state, either of the homeostatic mechanisms which are elicited to control stress or of the morbid consequences of being stressed. In principle, such measures are not only objective but also appropriate for any population or population group situation in any culture. They also avoid the dangerous pre-judgment of whether or not some environment is stressful, for what can generate great stress in one individual may cause none in another. Environments may certainly contain stressors, but stress itself is a phenomenon of the organism not of the environment. Having said that, there are many problems both theoretical and practical in both obtaining the desired
physiological information and interpreting it. Some, such as blood pressure, can usually be obtained fairly easily, though readings can be very labile. However, others, such as hormone levels in urine or saliva, can be immensely difficult. For many purposes, especially cross-cultural comparisons, one would like 24-hour urine samples, but even with the most willing and co-operative of subjects, one or more urinations are likely to be missed, unless the subject is confined to a hospital bed!

Then there are the complex problems of interpretation. Epinephrine, for example, is often referred to as a stress hormone. The excretion is certainly greatly raised when people go into battle, examinations or competitive sport, but it is also raised in those playing in a pop band and lowered in those who report being endlessly bored. It would seem to reflect levels of psychological arousal and while many unpleasant experiences cause arousal, so can those we enjoy. Few would call a good party stressful.

Matters such as these are discussed at great length and with great authority in this book. It covers all the physiological approaches to measuring stress, considering both broad theoretical issues and the practical methods that have been used. It sets these discussions within the wider framework of study design, varying culture and research ethics with populations. It is surely indispensable for any anthropologist studying stress, but with its emphasis on practical matters it should also be of great value to clinicians, psychologists and physiologists. It has no competitors; there is no other book like it.

Geoffrey A. Harrison