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978-1-107-00124-4 — Sequential Analysis and Observational Methods for the Behavioral Sciences
Roger Bakeman , Vicenç Quera
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SEQUENTIAL ANALYSIS AND OBSERVATIONAL METHODS FOR THE BEHAVIORAL SCIENCES

Behavioral scientists – including those in psychology, infant and child development, education, animal behavior, marketing, and usability studies – use many methods to measure behavior. Systematic observation is used to study relatively natural, spontaneous behavior as it unfolds sequentially in time. This book emphasizes digital means to record and code such behavior; although observational methods do not require them, they work better with them. Key topics include devising coding schemes, training observers, and assessing reliability, as well as recording, representing, and analyzing observational data. In clear and straightforward language, this book provides a thorough grounding in observational methods along with considerable practical advice. It describes standard conventions for sequential data and details how to perform sequential analysis with a computer program developed by the authors. The book is rich with examples of coding schemes and different approaches to sequential analysis, including both statistical and graphical means.

Roger Bakeman is professor emeritus in the Psychology Department at Georgia State University. He is a fellow of the American Psychology Association and the Association for Psychological Science, and has served as program co-chair for biennial meetings of the Society for Research in Child Development (SRCD) and the International Conference of Infant Studies (ICIS). He is author, with John M. Gottman, of *Observing Interaction: An Introduction to Sequential Analysis*; with Vicenç Quera, of *Analyzing Interaction: Sequential Analysis with SDIS and GSEQ*; and with Byron F. Robinson, of *Understanding Statistics in the Behavioral Sciences* and *Understanding Log-linear Analysis with ILOG*. He was an associate editor for *Infancy* and has served on editorial boards for several other journals.

Vicenç Quera is a professor in the Department of Behavioral Science Methods, Faculty of Psychology, at the University of Barcelona; director of the Master and Doctorate Programme in Primatology; a member of the Institute for Brain, Cognition and Behavior; and leads the Adaptive Behavior and Interaction Research Group at the University of Barcelona. He is co-author, with Roger Bakeman, of *Analyzing Interaction: Sequential Analysis with SDIS and GSEQ*. He has served on the editorial board of *Behavior Research Methods*, *Psicológica*, and other journals, and his articles have appeared in numerous journals, including *Psychological Bulletin*, *Psychological Methods*, *Behavior Research Methods*, and *Social Science and Medicine*.

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PREFACE

We wrote this book because it's time. The TLA (three-letter acronym) for *because it's time* is BIT, and what used to be called the bit-net (now the Internet) let the authors begin their long-distance collaboration between Atlanta and Barcelona. When we began working together in the early 1990s, many investigators believed – with some justification – that observational methods were appealing but too expensive and too time-consuming. At that time, analog video recording on tape had replaced film, and electronic means of recording observational data were replacing paper and pencil; yet most electronic and computer systems were specialized, expensive, and a bit cumbersome. We knew the digital revolution had begun, but we had no idea it would have the reach and impact it has today.

As we begin the second decade of this century, times have indeed changed. We now live in an image-saturated world where no moment seems private and everything seems available for instant download. Thus it is no wonder that researchers increasingly see merit in digitally recording behavior for subsequent systematic observation. Indeed, for recording behavior, digital has become the standard and preferred method. And although the systematic observation of the sort described in this book can still be done live, it works far better when behavior is digitally recorded for later replay, reflection, and review. Digital multimedia (audio-video) files can be created, copied, played, and stored with relative ease – and increasingly at minimal expense.

Coding behavior for subsequent quantitative analysis has likewise been transformed by the digital revolution. Computer-assisted coding programs remove much of the tedium and potential for error from the coding task – and can even make coding fun. Once such programs were a bit exotic, few in number, and required relatively expensive equipment. Now – given digital multimedia files – such programs are easier to implement, and the kind of computer capability they require has become ubiquitous and inexpensive.

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As a consequence, users have more choices than formerly, and some software has become less expensive or even free.

Spurred by the advent of digital recording and coding and by their greater ease and accessibility, we think it is time to revisit matters first discussed in our 1995 book, *Analyzing Interaction: Sequential Analysis with SDIS and GSEQ*. In the early 1990s – recognizing the power of standard formats such as those underlying almost everything the Internet touches – we defined a standard set of conventions for sequential observational data: the Sequential Data Interchange Standard, or SDIS. We then wrote a general-purpose computer program for analyzing sequential observational data that relied on those standards: the General Sequential Querier, or GSEQ. Our 1995 book had described how to run this program in the dominant computer system of the day; that system (the Disk Operating System, or DOS) is now essentially extinct, and the book is out of print. GSEQ, however, has now been updated to run in the Windows environment (the current version is available at www.gsu.edu/~psyrab/gseq or www.ub.edu/gcai/gseq).

The present book differs from our 1995 book in several ways. Primarily, it is greatly expanded in scope: it focuses on observational methods generally and is not confined to the details of GSEQ. It also offers considerable practical advice regarding sequential analysis and data analytic strategies for sequential observational data – advice that applies whether or not GSEQ is used. At the same time, we have striven to write a relatively brief and nonencyclopedic book that is characterized by straightforward, reader-friendly prose. Here, the interested reader may still learn how to use GSEQ effectively with sequential observational data, if desired, but should also be able to gain a sound conceptual overview of observational methods – a view grounded in the contemporary digital world.

It is the grounding in the digital world and its explication of GSEQ capabilities that most distinguishes this volume from the book Roger Bakeman wrote with John Gottman, *Observing Interaction: An Introduction to Sequential Analysis* (1st ed. 1986, 2nd ed. 1997). Granted some conceptual overlap, the topics covered in the two volumes are sufficiently different that *Observing Interaction* can easily be read with profit as a companion to this one. Certainly the intended audience is the same.

The audience we have in mind consists of behavioral and social science researchers, of whatever level, who think observational methods might be useful and who want to know more about them, or who have some familiarity with observational methods and want to further hone their skills and understanding. Apart from an interest in behavioral research, we assume

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that readers of this volume will be familiar with research methods and statistical analysis, at least at the level presented in introductory courses in these topics. Such knowledge may not be needed for the first chapter – which is intended as a basic introduction to observational methods generally (and which more knowledgeable readers may skim) – but is required for subsequent chapters.

As with our 1995 book, many people have helped us in our task. One author Roger Bakeman (RB) recognizes the debt owed his graduate school advisor, Robert L. Helmreich, who first encouraged him to learn more about observational methods, and his debt to Gene P. Sackett, who introduced him to sequential analysis. For RB, those interests were honed in collaborative work at Georgia State University, beginning first in the 1970s with Josephine V. Brown, a lifelong friend; and continuing since the 1980s with Lauren B. Adamson, an invaluable friend, supporter, and research partner. More recently, Augusto Gnisci of the Second University of Naples and Eugene H. Buder and D. Kimbrough Oller of the University of Memphis have helped us improve GSEQ, our computer program for sequential analysis. Eugene H. Buder also offered many thoughtful and cogent suggestions for improving an earlier draft; we appreciate his contribution to the clarity of the final volume, while taking responsibility for any murkiness that remains. The other author Vicenç Quera (VQ) recognizes the debt owed the late Jordi Sabater-Pi, who transmitted his enthusiasm for naturalistic research to VQ and first taught him how to observe and analyze behavior systematically; and his debt to his early mentor, colleague, and friend, Rafael López-Feal, who supported and encouraged his teaching and research. RB would also like to acknowledge Maria Teresa Anguera, who translated Bakeman and Gottman (1986) into Spanish, invited RB to speak at the University of Barcelona in 1991, and introduced us. Our collaboration began immediately and has now continued through almost two decades.

As is always the case, colleagues and friends – too many to mention – have contributed to our thinking and work over the years. RB would like to thank, in particular, Daryl W. Nenstiel, who – in addition to being a lifelong critic and partner – attempted to improve the prose of the current volume (any remaining flaws, of course, remain ours), and Kenneth D. Clark, who manages to keep RB on target and humble. VQ would like to thank Esther Estany, who from time to time manages to extract him from writing papers and computer code to visit distant deserts and other exotic regions, and to his colleagues from the Adaptive Behavior and Interaction Research Group at the University of Barcelona for sharing good and bad academic times and for their irreplaceable friendship and collaboration.

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