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Model for Intensive Longitudinal Data. Edited by Theodore A. Walls and Joseph L. Schafer. New York: Oxford University Press, 2006. Pp. 288.

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Sociologists, brace yourselves: just when you thought you had begun to understand the nature of conventional longitudinal panel data designs (with no more than 5–10 waves of measurement) and had conquered the analytic tools typically applied thereto, there is a sweeping change in the works. The new panel data formats are termed *intensive longitudinal data* (ILD) designs in this volume, which is about the development of new statistical approaches suitable for the analysis of ILD.

As referenced by the editors, ILD arise in any situation wherein quantitative or qualitative characteristics of multiple individuals or study units are recorded on many occasions, where “many” may mean tens, hundreds, or even thousands. Some of the oldest ILD came from diary studies, which have been used in sociology for decades. But the new wave of ILD studies has been made possible by recent technological developments in the form of small electronic devices, such as palmtop computers that prompt study participants at various times of the day to record responses to questions. Other techniques involve automatic sensing of physical behaviors (e.g., the number of steps taken) or physiological states (e.g., blood pressure) through ambulatory monitoring devices. The frequency or spacing of measurements may be regular or irregular, fixed or random, and the variables measured on each occasion may be few or many. The result of these design characteristics is that the resulting data sets may be huge.

To date, ILD designs have been used primarily in the biomedical sciences and, among the social sciences, in psychology. Among psychologists, the frequent recording of thoughts, feelings, or actions by electronic means has been termed the *experience-sampling method* and *ecological momentary assessment*. There is no doubt that we soon will see use of data from such designs in the sociological literature.

In the introduction, the editors highlight several themes that emerge in the chapters of the book. For one thing, *the complexity and variety of individual trajectories is multiplied* and may be such that it cannot be adequately modeled by conventional polynomials. Second, *the role of time as a covariate becomes more complex* as morning may be different from evening and Wednesday is different from Sunday. Third, *subjects may vary not only in their means, but also in their variances and covariances*. Fourth, *relationships among variables may change over time*. Fifth, *there may be self-regulatory mechanisms at work* such that, say, a high level of a response at one occasion influences the distribution of the response at a later occasion.

The book contains 11 chapters. All of the first ten chapters contain empirical applications to ILD, and the eleventh chapter describes coming

innovations in ILD data collection. Chapter 1, by Theodore Walls, Hyekyung Jung, and Joseph Schwartz, reviews the multilevel linear model and how it can be adapted to ILD designs. Chapter 2, by Joseph Schafer, complements chapter 1 by reviewing a popular alternative to multilevel regression, especially in biostatistics, namely, marginal modeling of longitudinal data with generalized estimating equations (GEE). GEE treats within-subject covariances as a nuisance and focuses instead on robust estimation of population-average regression coefficients. With ILD, however, interesting features of the covariance structures may remain hidden beneath these average coefficients. In chapter 3, Runze Li, Tammy Root, and Saul Shiffman describe functional data analysis (FDA), which moves away from simple parametric curves to describe high-intensity data by more general and flexible functional forms. They specifically show how to insert local polynomial regressions into a multilevel regression model. Chapter 4, by Donald Hecker, Robin Mermelstein, and Brian Flay, describes item response theory (IRT)/latent trait models, which are used extensively in educational testing and psychological measurement. The authors present a concise review of these models, relate them to multilevel regression models, show how software for multilevel regression models can be used to estimate the parameters of IRT models, and describe applications to ILD. In chapter 5, Carlotta Fok and James Ramsay bring more FDA-related ideas into multilevel regression in the context of longitudinal series that exhibit both cyclic and long-term trends.

Chapter 6, by Michael Rovine and Theodore Walls, conjoins ideas from time series analysis to multilevel regression by defining a first-order autoregressive equation for each study participant with parameters that can vary randomly from one participant to another. Chapter 7, by Moon-Ho Ho, Robert Shumway, and Hernando Ombao, presents a self-contained treatment of Gaussian state-space modeling and shows how many well-known classes of models are actually special cases of the Gaussian state-space model. In chapter 8, James Ramsay introduces basic concepts in the design of feedback loops for controlling the performance of an input-output process. These ideas, which are basic tools of control systems engineering, use differential equations to describe the dynamic characteristics of a system. Differential equations also are a key to chapter 9, by Steven Boker and Jean-Philippe Laurenceau, which explains how dynamical systems models can describe self-regulation, a process by which an individual maintains equilibrium with respect to a variable by responding to information about temporal changes in that variable's state. Up to this point, all of the chapters have assumed that the data to be analyzed are quantitative or qualitative measurements taken on individuals over many points in time. Chapter 10, by Stephen Rathbun, Saul Shiffman, and Chad Gwaltney, describes point process models for events or behaviors that are recorded continuously as they occur. The final chapter, by Sarah Nusser, Stephen Intille, and Ranjan Maitra, reviews emerging electronic technologies and their implications for next-generation ILD.

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Given this brief summary of the contents of the volume and their authors, several comments can be made. First, it is evident that the multilevel or hierarchical linear model framework is a workhorse for many of the chapters, which seek to adapt this model to the nature of ILD designs. Second, there are not many major topics in contemporary statistical analysis that are missing from the volume, but there are a few. These include event-history models, counterfactual causal inference, and techniques of variable reduction. Third, the editors and authors in the volume come from statistics or psychology departments. None are from applied statistics in sociology. Yet there is much that sociologists can learn from the chapters of the volume, which tend to be nice, self-contained, up-to-date, and fairly comprehensive overviews of statistical tools that many of us will want to know something about and/or have occasion to use from time to time. Thus, it is the kind of volume that professionals will want to keep on their shelves to study and reference. In addition, it could be quite useful for graduate seminars to be organized around the volume. In brief, I recommend it highly and hazard the opinion that sociologists, demographers, and related social scientists will develop their own companions to this volume in future years.

Goffman Unbound! A New Paradigm for Social Science. By Thomas J. Scheff. Boulder, Colo.: Paradigm Publishers, 2006. Pp. xiii+229. \$27.95.

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The year 2006 was a good one for devotees of the late Erving Goffman. We were treated to Greg Smith's *Erving Goffman* (Routledge, 2006), an expert exposition of Goffman's theoretical project as it evolved over his career. Now comes Thomas Scheff's *Goffman Unbound*. As its subtitle implies, this is no mere summary or synopsis of Goffman's writings; rather, it is a pioneering attempt to resuscitate the Goffmanian tradition so as to revitalize social science generally. Scheff dedicates several chapters to reviewing Goffman's signal contributions, notably *Asylums*, *Frame Analysis*, and *Interaction Ritual*. But Scheff states clearly, early, and often his original argument concerning Erving Goffman's work: Contemporary sociology is too cognitive in orientation and its methods too geared toward the study of social structure. Goffman's genius, meanwhile, derives from his astute exploration of the "microworld of emotions and relationships ([the] ERW)" (p. vii). Reading Goffman remains epiphanic today insofar as it forces us to break with the natural attitude of everyday life ("trope clearing," Scheff labels this phenomenon). By adopting a Goffmanian lens, we become aware of the ERW and its ongoing relevance for the production—indeed, the performance—of social reality.

Ongoing interest in Erving Goffman is remarkable given the oft-heard