***Dyadic Data Analysis* by David A. Kenny, Deborah A. Kashy, and William L. Cook. New York, NY: Guilford, 2006.**

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Let's face it, so-called methodological 'innovations' or 'breakthroughs' in the social sciences are relatively commonplace. In the last few decades, these alleged developments have been on the rise and sometimes (sometimes not) they influence or transform traditional ways of working and thinking. Yet, how many of these 'big things' are truly original, important contributions? How many actually gain a lasting place in scientific practice? Very few by most accounts. Not all of us can be a Campbell, a Cohen, a Cook, a Cronbach, or a Fischer; or, for that matter a Kenny, who with Baron gave us the classic moderator-mediator variable distinction (Kenny & Baron, 1986)—a principle that provides the basis for many forms and applications of theory-driven evaluation. Occasionally, very occasionally, however, a work is produced or a book published that fundamentally alters one's view about research design and data analysis. For me, *Dyadic Data Analysis* is that book.

The book consists of fifteen chapters. The first three chapters are the most important for understanding the basic principles involved in the analysis of dyads. As the authors emphasize in Chapter 1—in which the basic definitions and an overview of the study of dyads is presented—the dyad "is arguably the fundamental unit of interpersonal interaction" (p. 1). The central logic

underlying dyads is that dyad-pairs are somehow related; that is, they share something in common (e.g., husband and wife, supervisor and supervisee). Dyads need not be two people, however. They can be groups of people, organizations, or countries. They may even occur when two persons are unaware of each another and never interact (e.g., two patients of the same physician, two judges of the same object) or from repeated measurements from the same person. Consequently, the fundamental concept around which dyadic data analysis is premised is that of nonindependence (i.e., scores or measurements are linked in some way). Many standard statistical techniques (e.g., analysis of variance and regression), by contrast, operate on the assumption of independence; that is, data from each unit is unrelated to the data from other units. In addition to presenting these concepts, the first chapter covers other crucial aspects of dyadic analysis and studies involving between-dyads, within-dyads, and mixed (dyad) variables; major research designs used in the study of dyads; and dyadic data structures and organization of dyadic data.

Chapter 2, The Measurement of Nonindependence, begins with a lengthy presentation of statistical techniques for analysis of the degree of nonindependence using various classes of correlation coefficients, confidence intervals, Cohen's kappa, power, and other analytic procedures, taking into consideration both interval and nominal levels of measurement for both distinguishable and indistinguishable dyad members.[1] In this chapter the authors also propose strategies for dealing with less than optimal nonindependence in dyadic analysis, enumerate the consequences of ignoring nonindependence (e.g., biased *p*-values), and discuss what not to do with nonindependent data (e.g., just ignore it). There are a plethora of formulas in this part of the book and the authors suggest disregarding them when initially reading the chapter, a proposition with which I agree given that one may lose sight of the more important points made in the

chapter if bogged-down by trying to learn and apply the mathematics for estimating the numerous quantitative indices of nonindependence.

Things begin to get slightly more complex in Chapter 3—Analyzing Between- and Within-Dyads Independent Variables—in which the authors focus on dyadic data analysis strategies for assessing the effects of between- and within-dyad independent variables. These strategies do not differ dramatically from traditional, typically frequentists, analytic strategies designed to make comparisons between means, for estimating the effect of predictor variables, or for predicting values of dependent variables; they merely require thinking differently about the nature of the independent variable (i.e., dyads) and the acquisition of a few new methodological tools. Both parametric and nonparametric procedures for analyzing dependent variables within the scope of dyads are discussed in the chapter, as well as methods for determining effect sizes from dyadic studies. The techniques presented are designed to provide a solid foundation for many of the questions that interest dyadic researchers (e.g., simple differences between dyad-pairs), and as the authors note "this is perhaps the most useful chapter of the book" (p. 76). Prior to moving into the latter chapters of the book, I would suggest re-reading and working through the formulas and equations presented in this and the previous chapter as the content of the remaining sections is for serious enthusiasts of dyadic studies and often requires extensive calculations.

In Chapters 4 through 14 Kenny, Kashy, and Cook extend the dyadic approach to more sophisticated and elegant designs and analytic procedures, such as using multilevel models to study dyads, applying structural equation modeling to dyadic studies, social relations designs, one-within-many designs, social network analysis, dyadic indexes, idiographic versus nomothetic analysis, and various classes of over-time analyses (e.g., cross-lagged regression,

growth-curve analysis, sequential and event-history analysis), among many, many others. While it is beyond the scope of this review to present and discuss the many contributions and finer points presented in the numerous chapters of the book, as far as statistical texts are concerned, the writers should be commended for their succinct and clear presentation of often confusing concepts, principles, and procedures. The authors provide ample treatment of dyadic data analysis techniques, and most evaluators should be able to find numerous opportunities for application in their own work.

I spent considerable time studying this text and have applied several of the statistical techniques found in *Dyadic Data Analysis* to my own work in analyzing expert judge and panel dyad-pairs to estimate the attributes that most influence their decision-making process when judging the merits of national-level research evaluation models (Coryn, 2007). Presently, I am using a variation of the social network analysis methods presented in Chapter 11 to assess citation networks in evaluation books (i.e., whom has influenced whom?). For evaluators interested in the burgeoning study of social relations and networks and its applications in evaluative contexts (e.g., Durland & Fredricks, 2005), this book is a valuable resource.

One of the book's most unique contributions to research design and data analysis methodology is the straightforward, step-by-step presentation of dealing with nonindependence— an assumption often violated, overlooked, but not met in classical research design and analysis. Most of the concepts presented in the book will not be foreign to most methodologists, but they may require some serious rethinking of previously accepted conceptions of the relationships between persons, groups, and other objects. I found it extremely difficult to find much to criticize about this book. If pressed, however, I would have liked to have

seen more examples drawn from macro-level studies (e.g., organizations) and fewer from micro-level (e.g., individuals), social-relational studies.

In my view, this book has the potential to open new, important lines of thought and inquiry in terms of data structure, research design, and analysis in a multitude of disciplines, across a wide array of subject matter, and in both conventional and emerging paradigms. Perhaps dyadic data analysis principles can be applied to systems theory and approaches (which is basically concerned with problems of relationships, of structures, and of interdependence, rather than with the constant attributes of objects), for example? It also has the potential not only to alter applications of our existing tools but also to create new uses for them. As eloquently noted in the book's foreword, "Cutting-edge research and statistical methods do more than simply facilitate better or more research; they also broaden and deepen our theoretical understanding…" (p. ix). Alas, the scientific community is often punitive against innovation and sometimes incompetent in recognizing it. We are all quite familiar with Gregor Mendel (1822-1884) and his groundbreaking theories of heredity that paved the way to modern genetics. Regrettably, Mendel's peers did not recognize the importance of his work at the time and it was originally rejected, particularly by the eminent Swiss botanist Karl Nägeli (1817-1891), who had developed his own theory of evolution known as orthogenesis. I sincerely hope this is not the case for Kenny, Kashy, and Cook's *Dyadic Data Analysis*.

Author note

1. The difference between distinguishable and indistinguishable dyad-pairs is that in distinguishable dyads, two members of a dyad-pair can be differentiated from each

another by some variable. For instance, a distinguishable dyad-pair could be husband and wife, whereas an indistinguishable dyad-pair might be same-sex friends.

References

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