

***Multiple Regression: Testing and Interpreting Interactions*, by Leona S. Aiken and Stephen G. West. Newbury Park, CA: Sage, 1991, 212 pp.**

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As a research and statistical consultant I have noted that there is a broad misunderstanding of the meaning, analysis, and interpretation of interactions. Unfortunately, some textbooks discourage the general researcher from learning more about interactions by placing too much emphasis on mathematical principles and equations. In contrast, however, this book by Leona Aiken and Stephen West is oriented toward applications and is a good addition to the regression literature for social scientists. The book provides the reader with a clear discussion of how to use multiple regression analysis to structure, test, and interpret interactions and higher order nonlinear relationships.

Aiken and West present some practical techniques that already have been described in other major texts; however, they embellish their discussion with additional information. For example, the authors present the graphical approach of Cohen and Cohen (1975, 1983) for describing an interaction. To this, however, they furnish post-hoc procedures for testing the individual regression slopes that comprise the interaction. The book also contains useful terminology and practices that the authors have drawn from important statistical literature that is probably not read by the average social scientist. The authors' discussion of "centering" is a good example of this. Centering is accomplished by subtracting the mean from the values of a predictor variable, thus creating a transformed predictor with a mean of zero. Aiken and West show how this simple procedure reduces the problem of multicollinearity in regression equations that are structured to test interactions and higher order nonlinear relationships. The authors also show how centering improves the overall interpretation of these equations.

Aiken and West present rational guidelines on matters that have undoubtedly puzzled most anyone who has studied interactions with multiple regression analyses. They discuss,

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for example, the main issues in handling lower order coefficients when an interaction term is not significant. I am sure that many of us who have confronted this ask ourselves "Should I interpret the lower order terms with the nonsignificant interaction in the equation, or should I rerun the analysis without including the interaction term?" The authors discuss the statistical issues involved with this type of problem (i.e., the bias and efficiency of estimators), but they also instruct the reader to consider the theoretical context of the research. The reader is taught to proceed differently in situations where theory posits an interaction from situations where one is being more exploratory in nature. This type of balanced discussion adds to the practical utility of the text.

Although the Aiken and West book is a good resource, it is probably not suited for people who are inexperienced with multiple regression analysis. Readers should have at least one course in the subject or should read a more fundamental text, such as Cohen and Cohen (1983), before attempting the Aiken and West book.

For the most part, readers need an understanding of high school algebra. There are, however, a few parts of the book that require a basic understanding of calculus and matrix algebra, but these can be bypassed without losing an overall appreciation of the presentation.

To gain a fuller understanding of the text, readers should be familiar with a data analysis package (such as SPSS or SYSTAT) so they can practice the techniques that are presented by the authors. Readers will readily see the utility of centering, for example, when it is applied to their own data.

We do not live in a univariate world. The relationship among variables is complex; hence, the study of interactions is important. There are a few analytic approaches, such as classification and regression trees (Breiman, Friedman, Olshen, & Stone, 1984), that are designed to "find" interactions in data for us. Investigators who use those approaches do not need the Aiken and West book. However, those of us who explore and test specific interactions that are posited by a theory or model need a clear description of an appropriate methodology. The book by Leona Aiken and Stephen West fulfills that need. Their book is a very practical treatment of interaction analysis that can be appreciated by social scientists in many areas.

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