

## **Book Review:**

**Title:** *Logistic Regression Using the SAS System*

**Author:** Paul D. Allison

**Reviewer:** John Amrhein, Statistical Services Specialist, SAS Institute (Canada) Inc.

John Amrhein has served as a Statistical Services Specialist at SAS for four years. He teaches several courses concerning statistical analyses and data mining, including *Categorical Data Analysis Using Logistic Regression* and *Predictive Modeling Using Logistic Regression*. Prior to joining SAS, John worked for 10 years as a Mathematical Statistician at the U.S. Department of Agriculture where he used SAS to select and analyze samples for agribusiness surveys. He is currently writing a new SAS course titled, *Design and Analysis of Probability Surveys Using the SAS System*.

### **Review:**

This book is a must-have for statisticians who, familiar with modeling continuous responses, now find themselves needing to model categorical responses. Using a relaxed, conversational tone, Paul Allison takes the reader from a non-technical introduction of theory to fitting a model for longitudinal data -- with many topics in-between.

Allison begins with an easy-to-understand explanation of logistic regression theory, explaining how the methods of a linear regression model fail for a categorical response. Because the logistic model lends itself to easy interpretation through odds ratios, he spends ample time defining odds ratios, explaining how they are calculated and how to interpret them. Other topics in the introductory chapter include: maximum likelihood estimation, model fit statistics and interpreting model coefficients -- all of which Allison explains in a nontechnical fashion to facilitate understanding the specific topics in the remaining chapters.

*Logistic Regression Using the SAS System* has eight more chapters, each discussing a different type of model, depending on the nature of the response and the input data. Topics include: binary, multinomial, and ordinal logistic regression; discrete choice analysis; and longitudinal data analysis. SAS/STAT procedures used in these chapters include: LOGISTIC, GENMOD, CATMOD and PHREG.

The reader will find it helpful that Allison uses several practical data sets across analyses to illustrate the differences between the methods and procedures. Further, he provides complete interpretation of the output, drawing explicit conclusions from the results. Interspersed in these discussions are recommendations by Allison indicating which options to specify and little tricks to circumvent limitations.

*Logistic Regression Using the SAS System* provides an easy-to-read, easy-to-understand introduction to categorical response models. It is an excellent first choice on the topic before turning to more technical treatments of categorical data analysis such as *Categorical Data Analysis Using the SAS System* by Stokes, Davis and Koch.