



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

THE STATA JOURNAL

Editors

H. JOSEPH NEWTON
Department of Statistics
Texas A&M University
College Station, Texas
editors@stata-journal.com

NICHOLAS J. COX
Department of Geography
Durham University
Durham, UK
editors@stata-journal.com

Associate Editors

CHRISTOPHER F. BAUM, Boston College
NATHANIEL BECK, New York University
RINO BELLOCCO, Karolinska Institutet, Sweden, and
University of Milano-Bicocca, Italy
MAARTEN L. BUIS, WZB, Germany
A. COLIN CAMERON, University of California–Davis
MARIO A. CLEVES, University of Arkansas for
Medical Sciences
WILLIAM D. DUPONT, Vanderbilt University
PHILIP ENDER, University of California–Los Angeles
DAVID EPSTEIN, Columbia University
ALLAN GREGORY, Queen’s University
JAMES HARDIN, University of South Carolina
BEN JANN, University of Bern, Switzerland
STEPHEN JENKINS, London School of Economics and
Political Science
ULRICH KOHLER, WZB, Germany

FRAUKE KREUTER, Univ. of Maryland–College Park
PETER A. LACHENBRUCH, Oregon State University
JENS LAURITSEN, Odense University Hospital
STANLEY LEMESHOW, Ohio State University
J. SCOTT LONG, Indiana University
ROGER NEWSON, Imperial College, London
AUSTIN NICHOLS, Urban Institute, Washington DC
MARCELLO PAGANO, Harvard School of Public Health
SOPHIA RABE-HESKETH, Univ. of California–Berkeley
J. PATRICK ROYSTON, MRC Clinical Trials Unit,
London
PHILIP RYAN, University of Adelaide
MARK E. SCHAFFER, Heriot-Watt Univ., Edinburgh
JEROEN WEESIE, Utrecht University
NICHOLAS J. G. WINTER, University of Virginia
JEFFREY WOOLDRIDGE, Michigan State University

Stata Press Editorial Manager

LISA GILMORE

Stata Press Copy Editors

DAVID CULWELL and DEIRDRE SKAGGS

The *Stata Journal* publishes reviewed papers together with shorter notes or comments, regular columns, book reviews, and other material of interest to Stata users. Examples of the types of papers include 1) expository papers that link the use of Stata commands or programs to associated principles, such as those that will serve as tutorials for users first encountering a new field of statistics or a major new technique; 2) papers that go “beyond the Stata manual” in explaining key features or uses of Stata that are of interest to intermediate or advanced users of Stata; 3) papers that discuss new commands or Stata programs of interest either to a wide spectrum of users (e.g., in data management or graphics) or to some large segment of Stata users (e.g., in survey statistics, survival analysis, panel analysis, or limited dependent variable modeling); 4) papers analyzing the statistical properties of new or existing estimators and tests in Stata; 5) papers that could be of interest or usefulness to researchers, especially in fields that are of practical importance but are not often included in texts or other journals, such as the use of Stata in managing datasets, especially large datasets, with advice from hard-won experience; and 6) papers of interest to those who teach, including Stata with topics such as extended examples of techniques and interpretation of results, simulations of statistical concepts, and overviews of subject areas.

The *Stata Journal* is indexed and abstracted by *CompuMath Citation Index*, *Current Contents/Social and Behavioral Sciences*, *RePEc: Research Papers in Economics*, *Science Citation Index Expanded* (also known as *SciSearch*, *Scopus*, and *Social Sciences Citation Index*).

For more information on the *Stata Journal*, including information for authors, see the webpage

<http://www.stata-journal.com>

Subscriptions are available from StataCorp, 4905 Lakeway Drive, College Station, Texas 77845, telephone 979-696-4600 or 800-STATA-PC, fax 979-696-4601, or online at

<http://www.stata.com/bookstore/sj.html>

Subscription rates listed below include both a printed and an electronic copy unless otherwise mentioned.

U.S. and Canada		Elsewhere	
1-year subscription	\$ 79	1-year subscription	\$115
2-year subscription	\$155	2-year subscription	\$225
3-year subscription	\$225	3-year subscription	\$329
3-year subscription (electronic only)	\$210	3-year subscription (electronic only)	\$210
1-year student subscription	\$ 48	1-year student subscription	\$ 79
1-year university library subscription	\$ 99	1-year university library subscription	\$135
2-year university library subscription	\$195	2-year university library subscription	\$265
3-year university library subscription	\$289	3-year university library subscription	\$395
1-year institutional subscription	\$225	1-year institutional subscription	\$259
2-year institutional subscription	\$445	2-year institutional subscription	\$510
3-year institutional subscription	\$650	3-year institutional subscription	\$750

Back issues of the *Stata Journal* may be ordered online at

<http://www.stata.com/bookstore/sjj.html>

Individual articles three or more years old may be accessed online without charge. More recent articles may be ordered online.

<http://www.stata-journal.com/archives.html>

The *Stata Journal* is published quarterly by the Stata Press, College Station, Texas, USA.

Address changes should be sent to the *Stata Journal*, StataCorp, 4905 Lakeway Drive, College Station, TX 77845, USA, or emailed to sj@stata.com.



Copyright © 2012 by StataCorp LP

Copyright Statement: The *Stata Journal* and the contents of the supporting files (programs, datasets, and help files) are copyright © by StataCorp LP. The contents of the supporting files (programs, datasets, and help files) may be copied or reproduced by any means whatsoever, in whole or in part, as long as any copy or reproduction includes attribution to both (1) the author and (2) the *Stata Journal*.

The articles appearing in the *Stata Journal* may be copied or reproduced as printed copies, in whole or in part, as long as any copy or reproduction includes attribution to both (1) the author and (2) the *Stata Journal*.

Written permission must be obtained from StataCorp if you wish to make electronic copies of the insertions. This precludes placing electronic copies of the *Stata Journal*, in whole or in part, on publicly accessible websites, file servers, or other locations where the copy may be accessed by anyone other than the subscriber.

Users of any of the software, ideas, data, or other materials published in the *Stata Journal* or the supporting files understand that such use is made without warranty of any kind, by either the *Stata Journal*, the author, or StataCorp. In particular, there is no warranty of fitness of purpose or merchantability, nor for special, incidental, or consequential damages such as loss of profits. The purpose of the *Stata Journal* is to promote free communication among Stata users.

The *Stata Journal*, electronic version (ISSN 1536-8734) is a publication of Stata Press. Stata, **STATA**, Stata Press, Mata, **MATA**, and NetCourse are registered trademarks of StataCorp LP.

Review of Interpreting and Visualizing Regression Models Using Stata by Michael N. Mitchell

Alan C. Acock
Department of Human Development and Family Sciences
Oregon State University
Corvallis, OR
alan.acock@oregonstate.edu

Abstract. In this article, I review *Interpreting and Visualizing Regression Models Using Stata*, by Michael Mitchell (2012a [Stata Press]).

Keywords: gn0053, graphics, regression, piecewise regression, visualizing interaction, multilevel/longitudinal, marginsplot, interpreting models

1 Introduction

If you use Stata's regression-related commands and believe that a picture is sometimes worth a thousand words, put Michael Mitchell's (2012a) new book on your essential reading list. Stata has remarkable graphics capabilities, which are especially powerful once you are familiar with the `marginsplot` command. Stata's own documentation on its graphic commands for regression analysis provides a great start to learning about these commands, but Mitchell's book takes you several steps beyond this. His earlier work on Stata graphics, *A Visual Guide to Stata Graphics* (Mitchell 2012b), is a useful reference because it illustrates hundreds of graphs and includes the code that created them. His new book is very different. It provides great examples of regression models and explains when these models would be most useful. Then it shows how you can enhance the results for your readers by developing appropriate graphics. My understanding of regression commands was strengthened by the excellent examples. There is much more systematic explanation than in his earlier book. Mitchell's use of real data makes the examples easier to understand. The use of data from the General Social Survey means that examples are relevant to a wide variety of applied researchers.

2 Summary

The book covers various regression applications, including continuous and categorical predictors, simple and complex interaction between types of predictors, panel and time-series models, logistic and multinomial logistic models, and working with complex sample designs. The core of the book demonstrates the richness and generality of the `marginsplot` command across all of these applications. Meaningful research questions are posed, and he shows how to use a regression-related procedure to answer each of

the questions and interpret the results. Only then does he show how to enhance the explanation using a graph. Even students with limited background in regression will find this approach very accessible. Those with strong backgrounds in regression will find many new ways to use graphs to explain results.

Many research questions are developed in ways that imply interaction by describing how the effects of predictors are not simply additive. They use terms such as protective or risk factors that work in combination to produce some outcome. Unfortunately, too often, researchers then proceed to restrict their analysis to additive models. One reason for this may be that we have trouble knowing how to visualize complex interactions for ourselves and for our readers. Mitchell shows how two-way and three-way interactions, including those between continuous variables, categorical variables, or a mixture of the two, can be presented graphically using the `marginsplot` command. Many researchers work with categorical outcome variables, and visualizing interactions in these applications is demonstrated.

3 Strengths and limitations

I have mentioned Mitchell's use of the `marginsplot` command a couple of times. This is because before I got Mitchell's book, I found this command hard to use and had no appreciation for its power. A major strength of this book is that Mitchell makes this command and its sister commands easy to use; thus he convinced me of their extraordinary power. His discussion of piecewise regression was very interesting and showed different strategies for fitting and illustrating these models. We often see people add a polynomial term to handle such models when there are good reasons to expect a sudden change requiring new intercept and slope. He makes these piecewise models easy to use. He provides an example of a longitudinal study of sleep comparing a control group, a group receiving medical intervention, and a group receiving an education intervention. Each group has a separate intercept and slope before the intervention. The graph then shows how the medical intervention and education intervention groups have a sharp change in their intercept and trajectory after the intervention begins. He presents similar piecewise models for categorical outcomes.

At 550 plus pages, this is a big book; but after you read the first two chapters and an appendix that covers the basic options for the `margins`, `marginsplot`, `contrast`, and `pwcompare` commands, you can skip to the sections that are relevant to what you are doing. If you need to know something Mitchell covered earlier in the book, you will find helpful cross references. As a result, the length is not a problem but a strength. I would like to see more coverage on some topics—for example, the book could be strengthened by including more on how to represent random effects in mixture models—but I would not want a single word deleted from any of the topics that are covered.

I have a place on the bookshelf by my desk for Mitchell's three books. When I have trouble with a data management problem, I first reach for *Data Management Using Stata* (Mitchell 2010). When I want to check on constructing a general graph, I reach for *A Visual Guide to Stata Graphics* (Mitchell 2012b). Now, when I am trying to think of a better way of showing readers something about a regression result, I reach for *Interpreting and Visualizing Regression Models Using Stata* (Mitchell 2012a).

4 References

Mitchell, M. N. 2010. *Data Management Using Stata: A Practical Handbook*. College Station, TX: Stata Press.

———. 2012a. *Interpreting and Visualizing Regression Models Using Stata*. College Station, TX: Stata Press.

———. 2012b. *A Visual Guide to Stata Graphics*. 3rd ed. College Station, TX: Stata Press.

About the author

Alan C. Acock is a University Distinguished Professor and Barbara Knudson Chair for Family Research and Policy in the Department of Human Development and Family Sciences at Oregon State University.