A Hands-On Introductory Tour of SAS® ODS Graphics

Ted Conway, Chicago, IL

ABSTRACT

You've heard that SAS® ODS Graphics provide a powerful and detailed syntax for creating custom graphs, but for whatever reason still haven't added it to your bag of SAS tricks. Let's change that! Workshop participants will quickly gain experience creating a variety of charts by using SAS PC to explore, run, and modify a number of SAS ODS Graphics code examples. An Excel-based workshop guide containing all the code and sample output for the exercises will be provided.

INTRODUCTION

Deciding what to put in a companion paper for a Hands-On Workshop (HOW), such as this one, poses a conundrum of sorts.

On the one hand, you want to save your material for the conference attendees. But on the other hand, you've got to at least make a case for why folks should consider attending your HOW!

So, with that in mind, this paper aims to explain why ODS Graphics belongs in your SAS programming bag of tricks.

Hope to see you there!

WHY SHOULD I LEARN SAS ODS GRAPHICS?

So, why learn SAS ODS Graphics – aren't your current methods of producing charts good enough?

Photo Credit: **Harris & Ewing**

Well, among other things, SAS ODS Graphics:

- Provides an easy-to-use, flexible, and rich feature set for data visualization.

- Facilitates the automation of chart creation, promoting reproducible and repeatable results.

- Scales, allowing you to produce dozens, hundreds, or even thousands of charts with a consistent look-and-feel.

- Enables you to create precisely-sized and formatted charts when needed.

- Is fully-integrated with SAS, giving you access to all the powerful analytic and data transformation features of SAS software, so you can get your data chart-ready in no time!

SAS ODS GRAPHICS – THE BIG PICTURE

The SAS ODS Graphics procedures and statements support the creation of a wealth of single and multiple panel charts.

- PROCs **SGPLOT**, **SGPANEL**, **SGSCATTER** are used to produce "standard" graphs.

- **GTL** (Graph Template Language) can be used with PROC **SGRENDER** to make custom graphs.

- The **SGDESIGN** PROC produces charts from SAS data sets and user-defined ODS Graphics Designer (SGD) files, which are created with the **SAS ODS Graphics Designer** GUI application.

In the HOW, we'll explore, run, and modify code for a variety of SAS ODS graph types drawn from the following, focusing primarily on the SGPLOT and SGPANEL procedures.

|		
✓ Bar Charts (Vertical, Horizontal, Grouped, Stacked)	✓ Multi-Panel Charts (SGPANEL, SGSCATTER)	✓ Mosaic Charts
✓ Scatter Plots (Including Grouped)	✓ High-low Plots	✓ Pie Charts
	✓ Needle Charts	✓ Surface Plots
✓ Histograms	✓ Vector Charts	✓ Text Plots
✓ Line Charts (Including Series)	✓ Basic REG Plots	✓ Band Plots
✓ Step Charts	✓ Dot Plots	✓ Fringe Plots
✓ Bubble Charts	✓ Box Pots (Vertical, Horizontal)	✓ Simple ODS Maps (Polygon)
✓ Waterfall Charts	✓ Heat maps	✓ GTL-Based Chart Composites

A selection of statements and options that enhance the appearance of charts – e.g., labels, axis options (including data tables), reference lines, colors, legends, font family/size/weight, transparency, bands, annotation, markers, insets, symbols, attribute maps, drawtext – will also be explored in the HOW.

HELLO, BAR CHART!

So, where can you find examples of SAS ODS Graphics in action?

Well, the SAS 9.4 ODS Graphics: Procedures Guide is a great resource, but it weighs in at 1,652 pages, so let's start here with a SAS ODS Graphics take on a "Hello, World!" Program to illustrate just how easy it can be to create a chart from your SAS data.

```
proc sgplot data=sashelp.prdsale;
vbar month / response=actual;
where year(month)=1994;
```
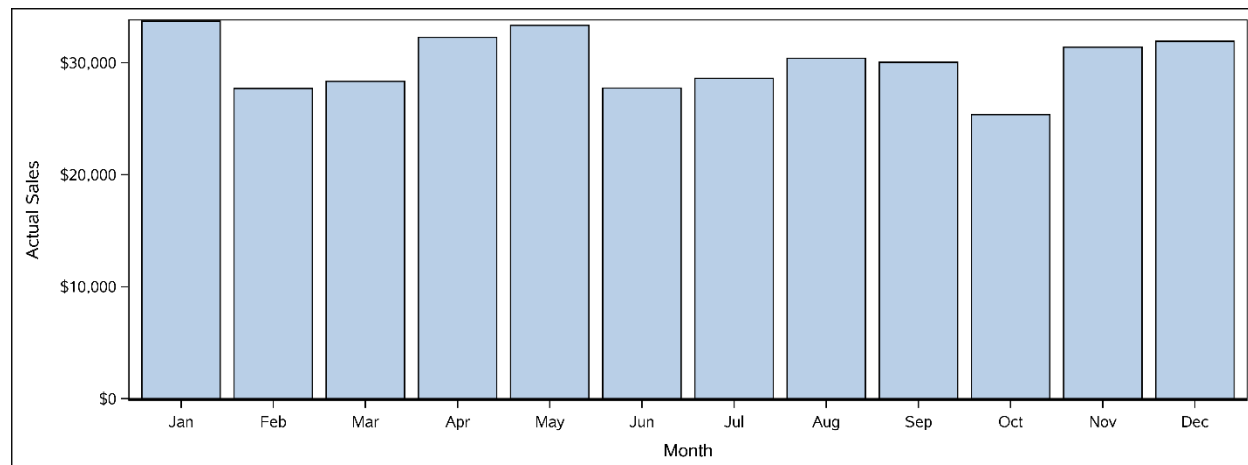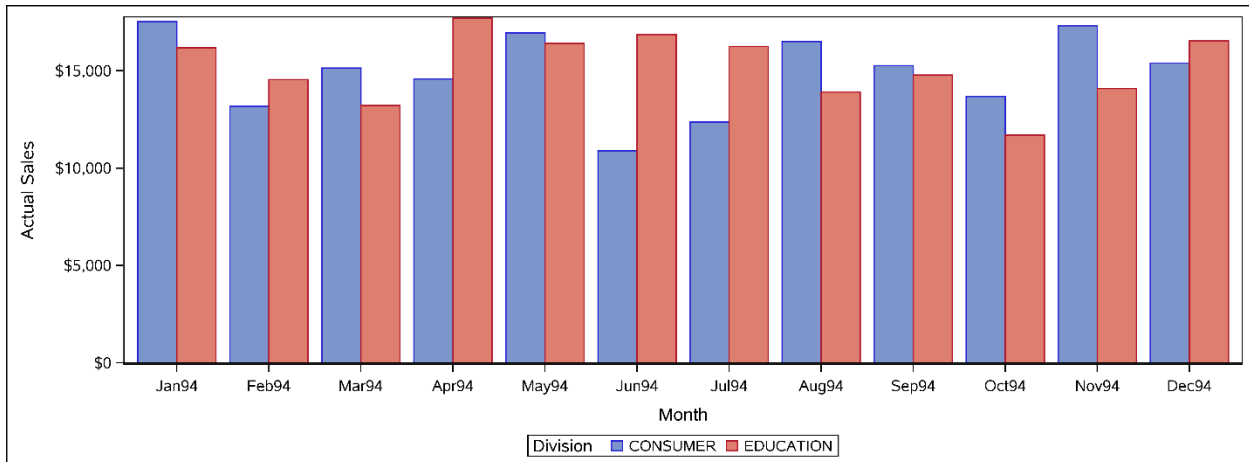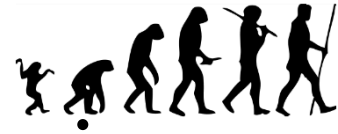

SASHELP.PRDSALE – 1994 Actual Sales by Month – Ungrouped Bar Chart

THE "EVOLUTION" OF A BAR CHART

Want to go beyond the default? No problem! Using SAS ODS Graphics statements and options you can refine the look-and-feel of your charts to your heart's content – here are a couple of different takes on the same data as the previous example.

```
proc sgplot data=sashelp.prdsale;
vbar month / response=actual group=division groupdisplay=cluster;
where year(month)=1994;
format month monyy5.;
```


SASHELP.PRDSALE – 1994 Actual Sales by Month – Clustered Group Bar Chart
Illustration Credit: José-Manuel Benitos

```
proc sgplot data=sashelp.prdsale(where=(year(month)=1994));
styleattrs datacolors=(palegreen lightblue);
title height=12pt "1994 MONTHLY SALES";
vbar month /  response=actual group=division
              datalabel datalabelattrs=(size=8.5pt)
              seglabel seglabelformat=dollar9. seglabelattrs=(size=8.5pt);
xaxis display=(nolabel);
yaxis display=(nolabel) grid;
keylegend / title="" noborder;
format actual dollar9. month monname3.;
```
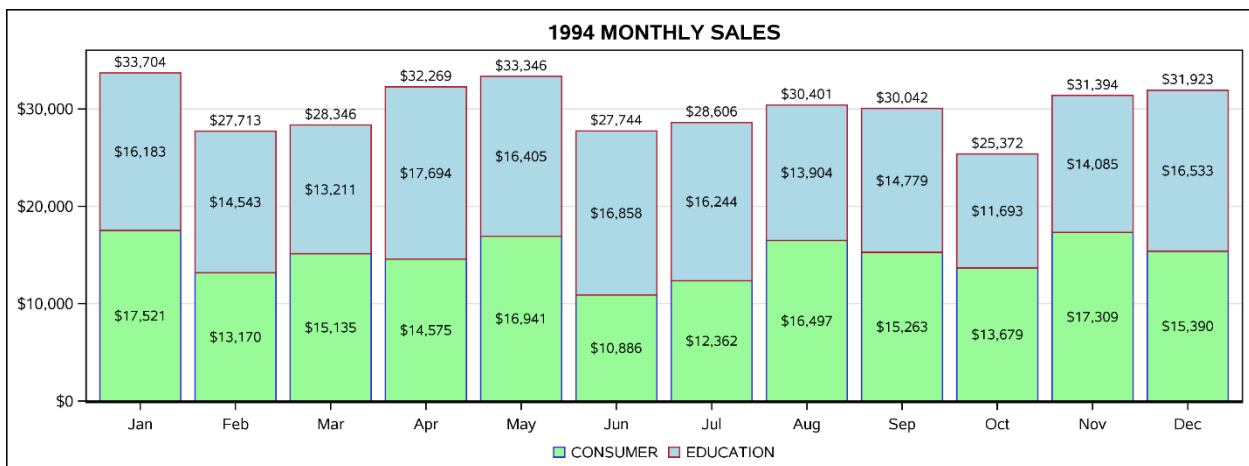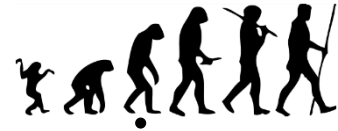

SASHELP.PRDSALE – 1994 Actual Sales by Month – Stacked Group Bar Chart

CONCLUSION

The SAS ODS Graphics procedures and statements provide an easy-to-use, flexible, rich feature set for data visualization that promotes reproducibility and scalability.

So, if you're seeking a better way of producing better charts and graphs – and who isn't these days? – make sure that SAS ODS Graphics is in your bag of dataviz tricks!

REFERENCES

After MWSUG 2017, look for the Hands-On Workshop material on sasCommunity.org and lexjansen.com.

Conway, Ted and Torres, Zeke. "Creating and Sharing SAS ODS Graphics with a Code Playground Based on Microsoft Office." Available at http://support.sas.com/resources/papers/proceedings16/10180-2016.pdf

Delwiche, Lora D. and Slaughter, Susan J. "SAS Graphing Made Easy with ODS Graphics Procedures." Available at http://support.sas.com/resources/papers/proceedings09/158-2009.pdf

Kincaid, Chuck. "Introduction to ODS Graphics." Available at http://support.sas.com/resources/papers/proceedings17/1510-2017.pdf

SAS. "Graphically Speaking: Data Visualization with a focus on SAS ODS Graphics." Available at http://blogs.sas.com/content/graphicallyspeaking/

SAS. "SAS Product Documentation." Available at http://support.sas.com/documentation/index.html

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Ted Conway
ted.j.conway@gmail.com
@vivasasvegas (Twitter)

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are trademarks of their respective companies.