

## Abstract

There is certain required information that must be displayed in graphs used for technical reports. One who is involved in presenting graphic information has a format which particularly appeals to that person. The format to which a given software package defaults may not be the desired format. Enhancement is possible by experimenting with available options for presentation until the desired format is obtained. This poster session presentation deals with application of PROC GCHART to data as an example of graphic format enhancement for technical reports.

## Introduction

The purpose of any report is to convey information. It is highly desirable to write a report in such a fashion that it disseminates comprehensible information using the least number of words. Besides a text, many scientific reports contain graphically displayed information, in the form of graphs, charts, etc. The formats for these graphic displays may be fixed by convention, but the information should be labelled so that the reader need not guess as to what symbolism the analyst/writer used to represent the variables involved.

## Discussion

The purpose of this poster session presentation is to demonstrate a possible evolution of a graphic display from software default layout to one which may fit the particular requirements of the client. PROC GCHART has been used for demonstration. The data are real but have been disguised for proprietary reasons. Several panels of a graph are presented to show how one develops a graph from default layout to the final format. Trial and error plays a part in the evolution of the graph's format. The colors in this presentation were used only for effect, one may opt to use more than one color depending on the report requirements.

The syntax for this process, as well as the resulting graphs, accompany this presentation. The graphs and text are outputted to a Zeta 887 (TM) plotter.

The first attempt at graphing a data set using PROC GCHART used three "TITLE" statements, a "DATA=" statement, and a defined

"VBAR" statement with options "SUMVAR" and "GROUP". A graph resulted which was all in one color, had three titles (the first larger than the succeeding two), crosshatched bars, an ordinate-axis label of "MEANSUM" (which is meaningless to most clients), and some abscissa labels with dingbats. Let us call this a "Bare Bones" representation. The labels for this first attempt were due to SAS/BASICS\*, not SAS/GRAPH\*. The user may desire that appropriate labels appear, and extraneous dingbats and labels be removed. The use of patterns other than crosshatching to discern columns is also desirable.

One learns to embellish graphs by further reading of the SAS/GRAPH\* manual. The manual directs the user to other chapters for the application of "AXIS", "PATTERN", "LABEL", and "VALUE" statements. After mastering the process of finding the appropriate sections of the manual to which the user is directed, the user can embellish the graphics.

The next five graphs were generated using the same data. The second graph has defined patterns, colors, text color, and unwanted dingbats. It was noticed that the footnote of the third graphs was not centered, and the correction was made in the fourth graph. However, the addition of a blank footnote for spacing in the fourth graph created a graph that was contracted (a condition that this user found undesirable). The only way to correct this situation was to eliminate one of the titles. The remaining graphs have title changes with the last graph being considered as the one which the client requested.

## Conclusion

Graphic embellishment can include the use of color, various typefaces (fonts), and heights and choices of patterns, etc. Using titles, footnotes, labels, and appropriate spacing aids in conveying the message. The graphic enhancement of information is complete when the client is satisfied, or the graphics cannot be enhanced beyond the capabilities of the software package.

References

SAS Institute, Inc. SAS\* User's Guide: Basics, Version 5 Edition, Cary, NC: SAS Institute, Inc., 1985. 1290 pp.

SAS Institute, Inc. SAS/GRAPH\* User's Guide, Version 5 Edition, Cary, NC: SAS Institute, Inc., 1985. 596 pp.

\*SAS is the registered trade mark of SAS Institute, Inc., Cary, NC, U.S.A.

Zeta (TM) is a trademark of the Nicolet Instrument Corporation.

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10 GOPTIONS DEVICE=ZETAB87 NODISPLAY GSFMODE=APPEND GSFNAME=GRAPHIX;
11 GOPTIONS NOSYMBOL NODASH NOTEXT82 COLORS=(BLUE);
12
13 PROC FORMAT;
14   VALUE $RX 'S'='STD DRUG'
15             'R'='RD DRUG';
16   VALUE $ST 'A'='SOURCE A'
17             'B'='SOURCE B'
18             'H'='SOURCE H';
19 DATA ENTRY; INFILE CARDS MISSOEVER;
20 TITLE1 'CARDIOVASCULAR DATA';
21 TITLE2 'TREATMENTS: STANDARD DRUG AND RD DRUG';
22 LENGTH TRTMT $1;
23 LABEL TRTMT='TREATMENT' USPUNITS=' USP UNITS';
24 INPUT TRTMT $ USPUNITS @;
25   GETOBS: INPUT SOURCE $ DATE MMDYY6. RABBIT RESPONSE @;
26           IF SOURCE=' ' ;
27           OUTPUT; GO TO GETOBS;
28   FORMAT TRTMT $RX. SOURCE $ST. DATE DATE7.;
29   CARDS;
30 PROC SORT DATA=ENTRY; BY TRTMT SOURCE RABBIT;
31 DATA CULL; SET ENTRY;
32   BY TRTMT SOURCE RABBIT;
33   IF USPUNITS>0;
34
35 PROC MEANS DATA=CULL MAXDEC=2 NOPRINT MEAN N STDERR STD MIN MAX;
36   BY TRTMT SOURCE;
37   VAR RESPONSE;
38 OUTPUT OUT=AVERAGE MEAN=MEAN N=N STDERR=STDERR STD=STD
39        MIN=MIN MAX=MAX;
40
41 PROC PRINT NOOBS DATA=AVERAGE;
42   VAR TRTMT SOURCE MEAN N STDERR STD MIN MAX;
43 RUN;
44 TITLE1 'CARDIOVASCULAR DATA';
45 TITLE2 'TREATMENTS: STANDARD DRUG AND RD DRUG';
46 TITLE3 'BARE BONES OPTIONS';
47
48 PROC GCHART DATA=AVERAGE;
49   VBAR TRTMT / SUMVAR=MEAN
50   GROUP=SOURCE
51 ;
52 RUN;
53 TITLE2 H=1.5 C=RED 'TREATMENTS: STANDARD DRUG AND RD DRUG';
54 TITLE3 'EMBELLISHED, BUT EXTRANEIOUS DINGBATS AND LABELS REMAIN';
55
56 PROC GCHART DATA=AVERAGE;
57 *****
58 *
59 * BARS GIVEN COLORS AND PATTERNS
60 * AXES GIVEN PERTINENT LABELS
61 * VALUE= GETS RID OF EXTRANEIOUS DEFAULT LABEL FOR "SOURCE"
62 *
63 *****
64 ;
65 AXIS1 LABEL=NONE
66       VALUE=(C=GREEN 'SOURCE A'
67             C=RED 'SOURCE B'
68             C=BLUE 'SOURCE H');
69 AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
70 PATTERN1 C=RED V=R3;
71 PATTERN2 C=GREEN V=X1;
72 PATTERN3 C=BLUE V=L2;
73 VBAR TRTMT / SUMVAR=MEAN
74       GROUP=SOURCE
75       PATTERNID=GROUP
76       CTEXT=GREEN
77       RAXIS=AXIS2
78       GAXIS=AXIS1
79 ;
80 RUN;
81 TITLE3 H=1.5 C=BLUE 'FOOTNOTE MUST BE SHIFTED TO LEFT FOR SYMMETRY';
82 FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES';
83

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126
127 PROC GCHART DATA=AVERAGE ;
128 *****
129 * LABEL= GETS RID OF EXTRANEODUS DEFAULT LABEL FOR "TREATMENT" *
130 * VALUE= GETS RID OF DINGBATS BY SPACING IN AXIS DEFINITION *
131 * *****
132 ;
133
134 AXIS1 LABEL=NONE
135 VALUE=(C=GREEN SOURCE A
136 C=RED SOURCE B
137 C=BLUE SOURCE H );
138 AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
139 PATTERN1 C=RED V=R3;
140 PATTERN2 C=GREEN V=X1;
141 PATTERN3 C=BLUE V=L2;
142 LABEL TRTMT='';
143 VBAR TRTMT / SUMVAR=MEAN
144 GROUP=SOURCE
145 PATTERNID=GROUP
146 CTEXT=GREEN
147 RAXIS=AXIS2
148 GAXIS=AXIS1
149 ;
150 RUN;
151 TITLE3 H=1.5 'SECONO FOOTNOTE CAUSES CONTRACTION OF GRAPH';
152 FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES';
153 FOOTNOTE2 H=1.5 ;
154
155 PROC GCHART DATA=AVERAGE;
156 *****
157 * SECONO FOOTNOTE FOR SPACING CAUSES A PROBLEM *
158 * CONTRACTION OF GRAPH OCCURS (I DO NOT LIKE THIS CONOITION) *
159 * *****
160 ;
161
162 AXIS1 LABEL=NONE
163 VALUE=(C=RED SOURCE A
164 SOURCE B
165 SOURCE H );
166 AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
167 PATTERN1 C=RED V=R3;
168 PATTERN2 C=BLUE V=L2;
169 PATTERN3 C=GREEN V=X1;
170 LABEL TRTMT='';
171 VBAR TRTMT / SUMVAR=MEAN
172 GROUP=SOURCE
173 PATTERNID=GROUP
174 CTEXT=RED
175 RAXIS=AXIS2
176 GAXIS=AXIS1
177 ;
178 RUN;
179 TITLE2 H=1.5 'MAYBE USING 2 TITLES WILL SOLVE PROBLEM ?';
180 FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES';
181 FOOTNOTE2 H=1.5 ;
182
183 PROC GCHART DATA=AVERAGE;
184 *****
185 * REMOVING ONE TITLE STATEMENT EXTENDS GRAPH TO ORIGINAL SIZE *
186 * SPACES ADDED TO FOOTNOTE1 CENTERS FOOTNOTE *
187 * *****
188 ;
189
190 AXIS1 LABEL=NONE
191 VALUE=(C=RED SOURCE A
192 SOURCE B
193 SOURCE H );
194 AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
195 PATTERN1 C=RED V=R3;
196 PATTERN2 C=BLUE V=L2;
197 PATTERN3 C=GREEN V=X1;
198 LABEL TRTMT='';
199 VBAR TRTMT / SUMVAR=MEAN
200 GROUP=SOURCE
201 PATTERNID=GROUP
202 CTEXT=RED
203 RAXIS=AXIS2
204 GAXIS=AXIS1
205 ;
206 RUN;
207 TITLE2 H=1.5 C=RED 'TREATMENTS: STANDARD DRUG AND RD DRUG';
208 FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES';
209 FOOTNOTE2 H=1.5 ;

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210      PROC GCHART DATA=AVERAGE;
211      *****
212      *
213      *   FINAL PRODUCT ACCOROING TO CLIENT'S WISHES
214      *
215      *****
216      ;
217      AXIS1 LABEL=NONE
218      VALUE=(C=RED      SOURCE A
219              SOURCE B
220              SOURCE H
221      AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
222      PATTERN1 C=RED V=R3;
223      PATTERN2 C=GREEN V=X1;
224      PATTERN3 C=BLUE V=L2;
225      LABEL TRTMT='
226      VBAR TRTMT / SUMVAR=MEAN
227      GROUP=SOURCE
228      PATTERNID=GROUP
229      CTEXT=RED
230      RAXIS=AXIS2
231      GAXIS=AXIS1
232      ;
233      RUN;

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CARDIOVASCULAR DATA  
TREATMENTS: STANDARD DRUG AND RD DRUG

TRTMT	SOURCE	MEAN	N	STDERR	STD	MIN	MAX
RD DRUG	SOURCE A	11.0667	3	2.42579	4.20159	6.8	15.2
RD DRUG	SOURCE B	12.5357	28	0.87127	4.61031	5.5	24.7
RD DRUG	SOURCE H	14.8379	29	0.76488	4.11898	7.4	24.4
STD DRUG	SOURCE A	13.0000	3	0.91652	1.58745	11.2	14.2
STD DRUG	SOURCE B	11.9467	30	0.60980	3.34001	4.7	18.0
STD DRUG	SOURCE H	14.7444	27	1.02700	5.33647	5.2	28.1