CUSTOMIZING GRAPHICS FOR TECHNICAL REPORTS USING SAS/GRAPH* SOFTWARE - PART I
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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.
OPTIONS DEVICE=ZETA887 NODISPLAY GSFMODE=APPEND GSFNAME=GRAPHIX;
11 OPTIONS NOSVMBOL NODASH NOTEXT82 COLORD={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 MISSOVER;
20 TITLE 'CARDIOVASCULAR DATA';
21 TITLE2 'TREATMENTS: STANDARD DRUG AND RD DRUG';
22 LENGTH TRTMT $1;
23 LABEL TRTMT='TREATMENT' USPUNITS='US UNITS';
24 INPUT TRTMT $ USPUNITS @;
25 GETOes: INPUT SOURCE $ DATE MMDDYY6. RABBIT RESPONSE @;
26 IF SOURCE=' ';
27 OUTPUT; GO TO GETOes i
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>O;
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 PROC PRINT NOOBS DATA=AVERAGE;
41 VAR TRTMT SOURCE MEAN N STDERR STD MIN MAX;
42 RUN;
43 TITLE 'CARDIOVASCULAR DATA';
44 TITLE2 'TREATMENTS: STANDARD DRUG AND RD DRUG';
45 TITLE3 'BARE BONES OPTIONS';
46 PROC GCHART DATA=AVERAGE;
47 VBAR TRTMT SUMVAR=MEAN GROUP=SOURCE
48 PATTERNIO=GROUP CTEXT=GREEN RAXIS=AXIS1 GAXIS=AXIS1
49 RUN;
50 TITLE2 H=I_S C=REO 'TREATMENTS: STANDARD DRUG AND RD DRUG';
51 TITLE3 'EMBELLISHED, BUT EXTRANEOUS DINGBATS AND LABELS REMAIN';
52 PROC GCHART DATA=AVERAGE;
53 IDa ••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••
54 BARS GIVEN COLORS AND PATTERNS
55 AXES GIVEN PERTINENT LABELS
56 VALUE: GETS RID OF EXTRANEOUS DEFAULT LABEL FOR "SOURCE"
57�性: ---------------------------
58 AXIS1 LABEL=NULL
59 VALUE=(C=GREEN 'SOURCE A'
60 C=RED 'SOURCE B'
61 C=BLUE 'SOURCE H');
62 AXIS2 LABEL=(A=GO H=I.5 C=RED 'MEAN RESPONSE');
63 PATTERN1 C=RED V=+R3;
64 PATTERN2 C=GREEN W=+X1;
65 PATTERN3 C=BLUE V=+L2;
66 VBAR TRTMT SUMVAR=MEAN GROUP=SOURCE
67 PATTERNIO=GROUP CTEXT=GREEN
68 RUN;
69 TITLE3 H=I.5 C=BLUE 'FOOTNOTE MUST BE SHIFTED TO LEFT FOR SYMMETRY';
70 FOOTNOTE1 H=-I_5 F=-TRIPLEX 'TREATMENTS AND RABBIT SOURCES';

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PROC GCHART DATA=AVERAGE;

*******************************************************************************
*                                                                            *
* LABEL= GETS RID OF EXTRANEOUS DEFAULT LABEL FOR "TREATMENT"                *
* VALUE= GETS RID OF DINGBATS BY SPACING IN AXIS DEFINITION                 *
*                                                                            *
*******************************************************************************

AXIS1 LABEL=NONE
VALUE=(C=GREEN ' SOURCE A ')
VALUE=(C=RED ' SOURCE B ')
VALUE=(C=BLUE ' SOURCE M ');
AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
PATTERN1 C=RED V=R3;
PATTERN2 C=GREEN V=X1;
PATTERN3 C=BLUE V=XL;
LABEL TRMT= ' ;
VBAR TRMT / SUMVAR=MEAN
GROUP=SOURCE
PATTERN=GROUP
CTEXT=GREEN
RAXIS=AXIS1
GAXIS=AXIS2

RUN;
TITLE2 H=1.5 'SECOND FOOTNOTE CAUSES CONTRACTION OF GRAPH';
FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES ';
FOOTNOTE2 H=1.5 ' ';
TITLE2 H=1.5 'MAYBE USING 2 TITLES WILL SOLVE PROBLEM ';
FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES ';

*******************************************************************************
*                                                                            *
*******************************************************************************

AXIS1 LABEL=NONE
VALUE=(C=RED ' SOURCE A ')
VALUE=(C=GREEN ' SOURCE B ')
VALUE=(C=BLUE ' SOURCE M ');
AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
PATTERN1 C=RED V=R3;
PATTERN2 C=BLUE V=XL;
PATTERN3 C=GREEN V=X1;
LABEL TRMT= ' ;
VBAR TRMT / SUMVAR=MEAN
GROUP=SOURCE
PATTERN=GROUP
CTEXT=RED
RAXIS=AXIS2
GAXIS=AXIS1

RUN;
TITLE2 H=1.5 ' ';
FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES ';
FOOTNOTE2 H=1.5 ' ';
TITLE2 H=1.5 'TREATMENTS; STANDARD DRUG AND RR DRUG';
FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES ';

*******************************************************************************
*                                                                            *
*******************************************************************************

AXIS1 LABEL=NONE
VALUE=(C=RED ' SOURCE A ')
VALUE=(C=GREEN ' SOURCE B ')
VALUE=(C=BLUE ' SOURCE M ');
AXIS2 LABEL=(A=90 H=1.5 C=RED 'MEAN RESPONSE');
PATTERN1 C=RED V=R3;
PATTERN2 C=BLUE V=XL;
PATTERN3 C=GREEN V=X1;
LABEL TRMT= ' ;
VBAR TRMT / SUMVAR=MEAN
GROUP=SOURCE
PATTERN=GROUP
CTEXT=RED
RAXIS=AXIS2
GAXIS=AXIS1

RUN;
TITLE2 H=1.5 'TREATMENTS; STANDARD DRUG AND RR DRUG';
FOOTNOTE1 H=1.5 F=TRIPLEX 'TREATMENTS AND RABBIT SOURCES ';
FOOTNOTE2 H=1.5 ' ';

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PROC GCHART DATA=AVERAGE;

FINAL PRODUCT ACCORDING TO CLIENT'S WISHES

; AXIS1 LABEL=NONE
  VALUE=('C'='RED', 'A'='SOURCE A', 'B'='SOURCE B', 'H'='SOURCE H');
AXIS2 LABEL=('A'='90 H='1.5 'C'='RED 'MEAN RESPONSE');
PATTERN1 C='RED V=RI3;
PATTERN2 C='GREEN V=CL1;
PATTERN3 C='BLUE V=CL2;
LABEL TRTMT='SOURCE A'
  RESPONSE');
YEAR TRTMT
  SUMVAR=MEAN
  GROUP=SOURCE
  PATTERN1=GROUP
  CTEXT='RED'
  AXIS=AXIS1
  GAXIS=AXIS1
RUN;

CARDIOVASCULAR DATA
TREATMENTS: STANDARD DRUG AND RO DRUG

<table>
<thead>
<tr>
<th>TRTMT</th>
<th>SOURCE</th>
<th>MEAN</th>
<th>N</th>
<th>STDERR</th>
<th>STD</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>RO DRUG</td>
<td>SOURCE A</td>
<td>11.0867</td>
<td>3</td>
<td>2.42579</td>
<td>4.20159</td>
<td>6.6</td>
<td>15.2</td>
</tr>
<tr>
<td>RO DRUG</td>
<td>SOURCE B</td>
<td>12.5357</td>
<td>26</td>
<td>0.87127</td>
<td>4.81031</td>
<td>5.5</td>
<td>24.7</td>
</tr>
<tr>
<td>RO DRUG</td>
<td>SOURCE M</td>
<td>14.8379</td>
<td>29</td>
<td>0.76488</td>
<td>4.11908</td>
<td>7.4</td>
<td>24.4</td>
</tr>
<tr>
<td>STD DRUG</td>
<td>SOURCE A</td>
<td>13.0000</td>
<td>3</td>
<td>0.91652</td>
<td>3.05745</td>
<td>11.2</td>
<td>14.2</td>
</tr>
<tr>
<td>STD DRUG</td>
<td>SOURCE B</td>
<td>11.9467</td>
<td>30</td>
<td>0.60980</td>
<td>3.40081</td>
<td>4.7</td>
<td>19.0</td>
</tr>
<tr>
<td>STD DRUG</td>
<td>SOURCE M</td>
<td>14.7444</td>
<td>27</td>
<td>1.02700</td>
<td>5.38647</td>
<td>5.2</td>
<td>28.1</td>
</tr>
</tbody>
</table>

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