

PROC TABULATE and ODS RTF:

The Perfect Fit for Complex Table Headers

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ABSTRACT

With the great advances in output design SAS and ODS offers the SAS programmer, the bar has definitely been raised in terms of producing presentation quality SAS output. Analysts frequently design table formats in packages such as Microsoft Word and Excel, and request that the SAS programmer fit SAS output to their specifications. This paper will present a challenge and solution, using PROC TABULATE and the RTF destination to fit SAS output into a pre-designed template. As the title indicates, a technique to rotate column headers without having to post-process in Microsoft Word will be demonstrated, using PC SAS Version 8.2 and PC SAS Version 9.1, as well as UNIX SAS Version 8.2. The code to produce a sample table will be dissected below, with relevant items highlighted in gray “tip” boxes. The full program and sample table will also be available as an appendix.

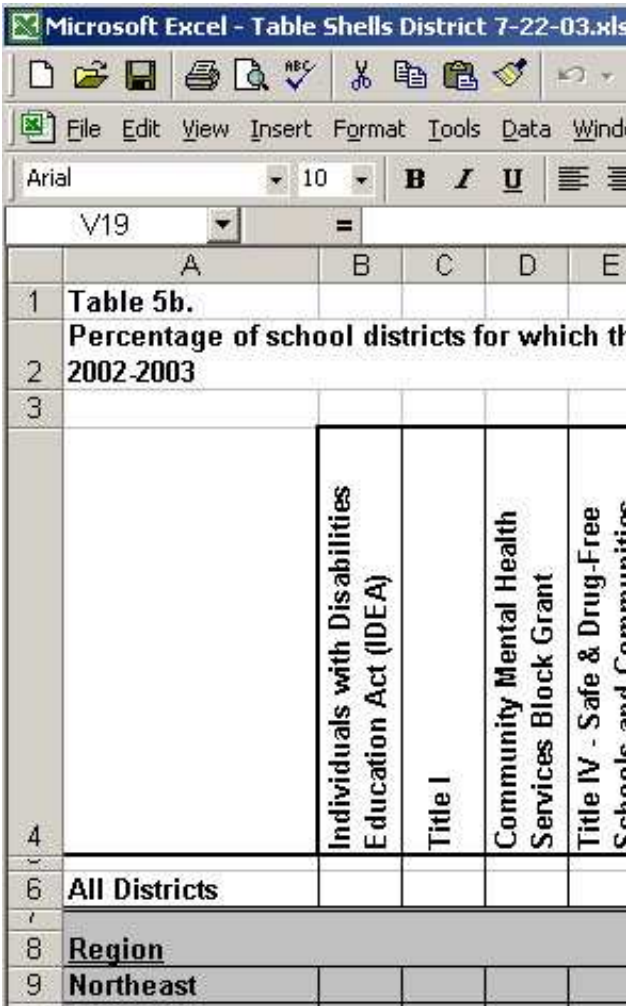
INTRODUCTION

As with many innovative programming techniques, the subject of this paper arose out of the programmer’s desire to produce the best result with the least amount of in-person intervention possible. I was presented with a series of spreadsheets created by hand in Microsoft Excel, and asked to “fill them in” with data from a national survey.

Previous programmers working on similar projects had used SAS to produce the desired statistics, but cut and pasted both the SAS tabulations and the Microsoft Excel “shells” into Microsoft Word. My challenge became to avoid the pitfalls of irreproducible results (not to mention all that mouse work!), and output SAS tabulations directly into Microsoft Word via the RTF destination or tagset in exactly the format shown in the pre-designed Microsoft Excel templates (sample below).

DECISIONS, DECISIONS

Since the final reports were to be submitted in Microsoft Word, the choice of an output destination or tagset was easy. RTF, or Rich Text Format, is a markup language easily assimilated into a Microsoft Word document. For a comprehensive subset of possible permutations in text formatting in a Word document, there is a RTF command driving the format. RTF also offers what I think of as “page style” formatting, similar to PDF or any other “printer” destination. This allows for a more controlled formatting process compared to tagsets designed to be viewed on a computer screen or imported into spreadsheet software, where the destination can override desired formats.



The screenshot shows a Microsoft Excel window titled "Microsoft Excel - Table Shells District 7-22-03.xls". The interface includes a menu bar (File, Edit, View, Insert, Format, Tools, Data, Window) and a toolbar. The active cell is V19. The table structure is as follows:

	A	B	C	D	E
1	Table 5b.				
2	Percentage of school districts for which th				
3	2002-2003				
4		Individuals with Disabilities Education Act (IDEA)	Title I	Community Mental Health Services Block Grant	Title IV - Safe & Drug-Free Schools and Communities
6	All Districts				
8	Region				
9	Northeast				

The choice of a procedure is much more difficult. There are three primary procedures which allow you to control styles within the procedure via style commands; PROC PRINT, PROC REPORT and PROC TABULATE.

PROC PRINT

```
proc print data=printit label uniform;
  var var2 chisq;
  var chisqp / style={foreground=temp.};
  var chisqdf;
  id var1;

run;
```

PROC REPORT

```
proc report data=anal nowd split=''
  spacing=10 style(report)=[cellpadding=12
  vjust=b] style(lines)=[just=left
  font_face=Verdana] ls=150;
  column ...;
  define a / ' ' computed
    style(COLUMN)={just=left
    font_face=Verdana font_size=9pt
    cellwidth=3.75in asis=on
    pretext=" " posttext=" "};
  compute before _page_/left;
    line "\S={font_face=Verdana
    font_size=14pt font_weight=bold}
    Your Title Here";
  endcomp;

run;

*program snippet courtesy of Carolyn Robin-
son, Abt Associates Inc.
```



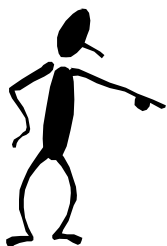
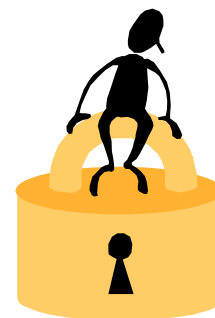
PROC TABULATE

```
proc tabulate data=anal missing format=20.
  style={bordercolor=black borderwidth=1
  cellwidth=118
  font=("Times New Roman",8pt,Normal)};
  var counter schc_rat ... /
  s={bordercolor=black borderwidth=2
  cellwidth=118
  font=("Times New Roman",8pt,Bold)};
  weight int_wgt;
  class region srvlevel ... /
  s={bordercolor=black borderwidth=2
  font=("Times New Roman",8pt,Bold)};
  tables all region srvlevel ...,
  schc_rat*(mean= ' '*f=comma9.4)
  / box={s={bordercolor=black
  borderwidth=2}};
  keyword all / s={font=("Times New
  Roman",8pt,Bold)};
  keylabel all='TOTAL';

run;
```

Our old familiar friend and long-time SAS workhorse PROC PRINT cannot hold a candle to PROC REPORT and PROC TABULATE in terms of the ability to control every aspect of SAS output. After attending many of the highly entertaining and informative debates on the two “titans” REPORT and TABULATE sponsored by Pass, Bruns, McNeill et al, I now wholeheartedly believe, with very few exceptions, that if it can be done in REPORT, it can be done in TABULATE, and vice versa. Both procedures allow for computing “on the fly,” presentation of numerous statistics, and wonderful flexibility in exactly how those statistics are presented. Note, however, that the syntax for using procedure level styles differ by both procedure and output destination.

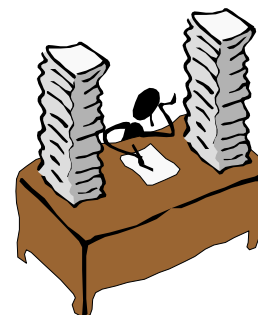
It all comes down to comfort level. I've been using SAS for over 26 years, and PROC REPORT, however wonderful, just wasn't around in the SAS equivalent of the Iron Age. PROC TABULATE, a much earlier addition to the SAS programmer's repertoire, had (and has) that comforting look and feel of FORTRAN code. PROC TABULATE has come a long way in terms of its capacity and design, and has definitely changed over the years, but remains most secure to me relative to PROC REPORT. My decision from the outset was to use PROC TABULATE with the RTF destination to produce a complex set of tables.



Comfort was not the only reason for choosing PROC TABULATE. One of PROC TABULATE's handy attributes is the ability to specify complex denominators "on the fly" and calculate percents based on the specified denominators. This particular set of tables was for a national survey of schools with a complex sample design. The client wished to have weighted numbers presented in a total column alongside columns with weighted percents based on different denominators by column, making PROC TABULATE the perfect fit. For some tables, a combination of Ns, percents and other statistics such as means were desired on a column by column basis, which was also possible in PROC TABULATE.

DOWN TO BUSINESS

Many of the pre-formatted tables I was asked to fill in had identical "row" variables, a set of seven descriptive variables with three or four values. This made it easy to set up a standard set of "class" variables in PROC TABULATE with a standard "style". Note that you can also have multiple class and classvar statements if you wished to format specific class variables in different ways. For example you might want to shade alternate class variables by adding a background option to your style statement. In this case since the reports were to be reproduced in black and white and grayscale and/or colors can sometimes not reproduce well, the client opted not to differentiate in this way.



TABULATE TIP:

Named Denominator

```
tables all region srvlevel ...,
       schc_ns*(mean*f=comma9.4)
       schc_any*(pctsum<counter>=>' '*f=pctpic.)
```

The "column" variables differed from table to table. The client wished to have sample numbers or means represented in the first column, and percentages using specific denominators represented in subsequent columns, which can be accomplished with ease with PROC TABULATE. Note that any denominator used must be in the VAR statement even if it is not "printed."

Note also the use of "cellwidth" in the style option statement. This determines the width of the column in MIPS. It can also be used in the PROC TABULATE statement itself. If present in both the PROC TABULATE and VAR statements, the cellwidth should match.

Cellwidth in both PROC TABULATE and PROC REPORT can assist with fitting in more columns across a page and is a more effective tool than using a format for variables to specify width.

TABULATE TIP:

Cellwidth=

```
var counter schc_any ... /
  s={bordercolor=black borderwidth=2
    cellwidth=100
    font=("Times New Roman",8pt,Bold)};
```

PROC TABULATE generates an automatic heading for statistics unless the programmer specifically blocks it in the table statement. The client did not wish the statistic heading to appear, yet also wished specific statistics to be appropriately identified, for example, with a percent sign following. While this could ordinarily be done with a format, percents that PROC TABULATE calculates "on the fly" are in whole numbers. A special user-defined picture format must be used in this case. I used the format suggested by Lauren Haworth in "PROC TABULATE By Example," a wonderful reference tool. Since the client wished the percent to be expressed with one decimal place, I modified the format with 9's instead of 0's (thanks to the suggestion of the Code Clinic staff at WUSS 2003). Without the modification, some percents were expressed incorrectly without a decimal place.

TABULATE TIP:

Calculated Percent Format

```
proc format;
    picture pctpic low-high='009.9%';
run;
```

To use this format and to eliminate the PCTSUM heading:

```
tables all region srvlevel ...,
schc_any*(pctsum<counter>= ' '*f=pctpic.)
...
```

The client also wished to experiment using a corporate logo in the tables. PROC TABULATE and PROC REPORT both allow the use of “preimage” graphics files. In PROC TABULATE, a logo can be easily inserted in the “box” in the top left corner of the output. The type of graphics file used is dependent on the SAS output destination: for the RTF destination and PROC TABULATE I used a JPEG file.

A clipped snapshot of the RTF file follows below.

TABULATE TIP:

Think INSIDE the box

```
tables all region srvlevel ...,
schc_ns*(mean*f=comma9.4)
schc_any*(pctsum<counter>= '% '*f=pctpic.)
...
/ box={s={bordercolor=black borderwidth=2
preimage='abt logo.jpg'}};
```

Table 13A
Type of School Staff Providing Mental Health Serv
by Selected School Characteristics: 2002-2003

	School Counselors	Any Cov
	Mean	
TOTAL	1.8532	
Region		
Northeast	2.2455	
South	1.6451	
---	-----	

All the abilities of PROC TABULATE and ODS RTF combined to allow me to produce most of the tables fairly easily. Some additional tips I gleaned along the way:

RTF TIP:

When is a .DOC not a .DOC?

RTF output, while it can be saved as a .DOC in the ODS RTF FILE= statement and opened directly in Microsoft Word®, remains an RTF file unless you “SAVE AS” regardless of the file extension. The same is true of HTML and MSOFFICE2K output files which can be saved as .XLS in the ODS xxx FILE= statement. You must SAVE AS to convert these output files from HTML. This is useful to know because both RTF and HTML files take up more space than their MS Word® or Excel® counterparts.

ODS PRINTER TIP:

To rotate your output so that it prints sideways for printer destinations such as RTF and PDF:

Options Orientation=Landscape;

STYLE TIP:

Hierarchy of Style Attributes

When using procedure level styles, care must be taken to account for the hierarchy of style attributes. For example, using a pre-written style in the ODS FILE= statement may conflict and/or be overwritten by a procedure level style, with some unexpected results. In addition, (I discovered the hard way), using procedure level styles on the procedure and subsequent statement lines can cause problems if they are different, such as different values for cellwidth. Consistency is key.

TABULATE TIP:

Effect of Missing Values in Class Variables, or, Where DID Those Observations Go?

These tables were created using data from a survey with a complex sample design, which involved stratification and weighting. There were usually multiple class variables involved, some of which had missing values. If there are any missing values in ANY class variables, PROC TABULATE eliminates those records from the tabulation. This may result in a much lower N than expected for the entire table. Care should be taken to expand the possible values of class variables to include missing if necessary.

UP WORDS AND ROTATE

At some point it had to happen. I reached a table (the template shown above) that I simply could not fit onto a page, despite my best efforts. The column headers as specified by the client were simply too long, and there were too many columns even with short column headers. I knew from experimenting with the too wide output file that I could post-edit in Microsoft Word® to rotate the column headers and fit the table on a page. But, I didn't WANT to have to post-edit. The answer to my dilemma came in my review of Cindy Tong's helpful NESUG '03 paper, "ODS RTF: Practical Tips" and the greatly appreciated technical assistance of Wayne Hester (SAS® R and D.)



```
<\rtf1\ansi\ansicpg1252\uc1\deff0\def
<\fonttbl
<\f1\fnil\fpqr0\fcharset0 ;>
<\f2\froman\fpqr2\fcharset0 Times New
>\<\colortbl;
\red0\green0\blue0;
\red0\green0\blue255;
\red0\green255\blue255;
\red0\green255\blue0;
\red255\green0\blue255;
\red255\green0\blue0;
\red255\green255\blue0;
\red255\green255\blue255;
\red0\green0\blue128;
\red0\green128\blue128;
\red0\green128\blue0;
\red128\green0\blue128;
\red128\green0\blue0;
\red128\green128\blue0;
\red128\green128\blue128;
\red192\green192\blue192;
>\<\stylesheet<\widctlpar\adjustright>
>\<\info<\title U8 SAS System Output><
```

RTF, like HTML, is a markup language which contains formatting commands. An RTF file can be viewed in a text editor as a text file.

It follows, then, that one could determine the command used to rotate column headers by reviewing the original RTF file produced by SAS and the post-edited file in Microsoft Word®. Looking at these massive files quickly dissuaded me, and I resorted to RT*M, "Rich Text Format (RTF) Specification, Version 1.6" of the Microsoft® Corporation referred to by Cindy Tong. Eventually I found the two commands of interest. Then the challenge became to replace the command for horizontal column headers with vertical column headers without resorting to post-editing in Word®.

it was post-processing in SAS®, within my reporting program. That I could live with! Instead of outputting directly to the RTF destination, the SAS output is directed to a intermediate RTF file which is then post-processed in a macro to change the RTF command for column header orientation before being output into the final RTF file. The macro, while used to change the column orientation in my case, could also be used to change other specifications.

RTF CONVERSION MACRO:

```
%macro do_one(source=xxx);
data temp ;
length line $400;
infile &source length=lg lrecl=1000 end=eof;
input @1 line $varying400. lg;
data _null_;
set temp ; retain mod 0 ;
file &source;
/* mods are done for the trow header data
only */
if (index(line,"\trowd\tkeep") > 0) then do
;
if (index(line,"\trowd\tkeep\trhdr") > 0)
then mod = 1;
else mod = 0;
end;
if (mod) then do;
/* this works because the commands are the
same width */
line=tranwrd(line,"\cltxlrtb","\cltxbtlr");
line=tranwrd(line,"\clvertalb","\clvertalt");
line=tranwrd(line,"\qc","\ql");
put line;
/* The header cell needs to be tall enough to
accept the change. */
/* You may need to adjust this depending on
what your column headers are. */
/* Measurement is in twips. 20 twips to the
point, 72 points to the inch.*/
if ( index(line,"\trowd\tkeep\trhdr") > 0)
then put "\trrh-1625" ;
end;
else put line ;
run;
%mend;

%do_one(source=rtf) ;

*indents and spaces removed; full code sample
at end.
```

The result is a perfectly sized landscape report with ro-
tated column headers, seen below.

Table Sb-Weighted
Percentage of School Districts For Which the Source is Among Their Top Five Sc
By Selected District Characteristics: 2002-2003

	# of Districts	Q8: IDEA Source of MH Svc Funding	Q8: Title I Source of MH Svc Funding	Q8: Comm MH Svc Block Grant Source of MH Funding	Q8: Title 4 Source of MH Svc Funding
TOTAL	14,752	61.5%	22.3%	6.9%	52.8%
Region					
Northeast	3,110	77.0%	17.0%	3.7%	58.2%
South	5,441	54.0%	26.1%	5.6%	53.2%
Midwest	3,330	61.3%	22.1%	7.2%	47.9%
West	2,872	59.4%	21.0%	12.1%	52.2%
Urbanicity					
Suburban	3,003	64.0%	26.1%	6.1%	47.6%

STOP! WAIT! Go! See WHAT TRAFFIC LIGHTING CAN DO FOR YOU

ODS in conjunction with PROC REPORT, PROC TABULATE and PROC PRINT also allow you to use background and foreground color in your output to highlight or differentiate columns, rows and variables. In PROC TABU-
LATE, background and foreground colors can be applied in the various style statements (for example, the PROC
statement, the CLASS statement(s), the CLASSLEV
statements(s), the TABLES statement(s), and the BOX
statement.) They can also be applied in a user-defined
style template. Colors can be assigned directly in the
style statement, or with a user-defined format.

Example of highlighting columns in
PROC TABULATE:

```
HIGHLIGHTING COLUMNS  
IN PROC TABULATE

proc format;
value colcol low-high='Cyan';
run;

...
tables all region,
noprvmh*sum=' '*f=comma9.*
{s={background=colcol.}};...
```

	Number of Schools	Not Providing MH Services	P
TOTAL	1,147	11	
Region			
Northeast	203	1	
South	291	3	
Midwest	414	5	
West	239	2	
Level			
Primary	570	5	
Middle	218	1	

Example of highlighting rows in PROC TABULATE using the CLASS statement:

HIGHLIGHTING ROWS IN PROC TABULATE
– CLASS STATEMENT

```
class region srvlevel loc_cat enr_cat2 /  
  s={background=lightblue  
    font=("Times New Roman",8pt,Bold)};  
run;
```

Percentage of Schools Collecting Various Ty
By Selected School Characteristics: 2002-200

	Has Access to Data		Types of Problem Presented Student
TOTAL	40,803	100.0%	60
Region			
Northeast	8,226	20.1%	60
South	10,516	25.7%	60
Midwest	13,865	33.9%	60
West	8,196	20.0%	60
Level			
Elementary	24,663	60.4%	60

Example of highlighting rows in PROC TABULATE using the CLASSLEV statement:

HIGHLIGHTING ROWS IN PROC TABULATE
– CLASSLEV STATEMENT

```
proc format;  
value regcol  
  1='Light Blue'  
  2='Pink'  
  3='Light Green'  
  4='Yellow';  
run;  
...  
classlev region /  
  s={background=regcol.  
    font=("Times New Roman 8pt")};  
run;
```

	Has Access to Data		Types of Problem Presented Student
TOTAL	40,803	100.0%	
Region			
Northeast	8,226	20.1%	
South	10,516	25.7%	
Midwest	13,865	33.9%	
West	8,196	20.0%	
Level			
Elementary	24,663	60.4%	
Middle	7,861	19.2%	

An additional request of the client was to perform significance tests on the tables created for this project using PROC TABULATE. Due to the complex survey sample design, these tables were created in SAS-callable SURVEYDATA. P-values were output from the PROC CROSSTAB procedure for every tabulation within each PROC TABULATE table, and the resulting data table was output to ODS RTF using PROC PRINT and a user-defined color format to denote significance at 2 levels (5% and 10%).

Example of Traffic-Lighting using a User-Defined Format and PROC PRINT

TRAFFIC LIGHTING USING PROC PRINT

```
proc print data=printit label uniform;
  var var2 chisq;
  var chisqp / style={foreground=temp.};
  var chisqdf;
  id var1;

run;
```

Tab	Chi Square Statistic	Chi Square P-Value Statistic	Chi Square Degrees of Freedom
1 Services	10.73	0.0979	6
1 Services	18.50	0.0053	6
1 Services	0.79	0.9400	4
1 Services	4.23	0.3757	4
1 Services	1.29	0.8632	4
1 Services	2.76	0.5994	4
1 Services	9.49	0.1490	6

OH NO! THEY BROKE IT!

A few months after I completed the programming for this project in SAS® Version 8.2, I had SAS® Version 9.1 installed. I wondered how my tables would look running 9.1, and tried one of my programs out. My hope was that the tables would look even better. Alas, my hope was unfounded.

Example of Table 21 produced using SAS® 8.2

Table 21- Unweighted
Percentage of Schools Collecting Various Types of Data and L
By Selected School Characteristics: 2002-2003

	Has Access to Data	Types of MH Problems Presented by Students	T Sch MH Pr
TOTAL	649	66.2%	
Region			
Northeast	137	63.5%	
South	150	67.3%	
Midwest	228	67.9%	
West	134	64.9%	
Level			

Table 21- Unweighted
Percentage of Schools Collecting Va
to Data),
By Selected School Characteristics:

<code>{\tc "Tabulate..."</code> <code>\FC \1}{\tc</code> <code>"Cross-tabular</code> <code>summary</code> <code>report" \FC \1</code> <code>2}{\tc "Table 1</code> <code>" \FC \13}</code>	Has Access to Data	Has Access to Data	Type Prob Presen Stud
TOTAL	649	100.0%	
Region			
Northeast	137	100.0%	
South	150	100.0%	

Example of Table 21 produced using SAS® 9.1 (no changes to code) – Yikes!

What on earth happened? I used the same style template and the same code as in 8.2, but there's gobbledygook in my box, the titles and footnotes are huge and in the wrong font, and my class variables are huge and in the wrong font. I turned to the ever helpful folks at SAS® Technical Support, and Bari Lawhorn gave me this helpful tip:

RTF files created by SAS now have the ability to utilize a table of contents, so the raw RTF file shows \tc instructions. You should be able to eliminate them from view from within MS Word by:

tools..options..view..
under FORMATTING MARKS make sure
ALL and HIDDEN TEXT are UN-checked

Okay, one problem solved and I didn't have to touch my code. Note that the goobledygook actually allows you to create a table of contents in your RTF document simply by adding "CONTENTS" at the end of your ODS RTF statement, an experimental feature of 9.1. See [HTTP://SUPPORT.SAS.COM/RND/BASE/TOPICS/ODSRTF/RTF901.HTML](http://support.sas.com/rnd/base/topics/odsrtf/rtf901.html) for more details on this and other items.

Example of Table 21 produced using SAS® 9.1 fixing MS Word® - Gobbledygook gone BUT...

Table 21- Unweighted
Percentage of Schools Collecting Va
to Data),
By Selected School Characteristics:

I	Has Access to Data	Has Access to Data	Type Prob Presen Stud
TOTAL	649	100.0%	
Region			
Northeast	137	100.0%	
South	150	100.0%	
Midwest	228	100.0%	

My titles, footnotes, and class variable formatting was still off. The titles were resolved by adding formatting information to the title statements. I tore my hair out a little (or a lot) on the class variable issue but eventually resolved it by adding a CLASSLEV statement with font information. Hurrah! Despite my initial dismay, it is clear that SAS has given us even MORE control over every aspect of our ODS output in 9.1. You just have to know what to tell it!

CODE CHANGES FOR SAS® 9.1

ADD:
classlev srvlevel loc_cat enr_cat2 /
s={font=("Times New Roman 8pt")};
Note that the headers for the row variables are formatted within the CLASS statement, while the values of the row variables are formatted within the CLASSLEV statement.
CHANGE:
title1 font="Times New Roman 9pt"
Bold 'Table 21-Weighted';
Note that you can also change other attributes of the title such as font color, etc. this way.

It should be noted that using a user-defined style template in Version 9.1 might have resolved these issues. How-

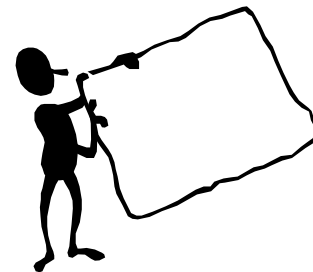
ever, the purpose of this paper was to highlight PROCEDURE LEVEL styles. I will leave the wonders and mysteries of PROC TEMPLATE to other authors!

Example of Table 21 produced using SAS® 9.1

**Table 21-Weighted
Percentage of Schools Collecting Various Types of D
By Selected School Characteristics: 2002-2003**

	Has Access to Data		Types of MH Problems Presented by Students	S M
TOTAL	40,803	100.0%	66.8%	
Region				
Northeast	8,226	20.1%	65.6%	
South	10,516	25.7%	68.2%	
Midwest	13,865	33.9%	68.4%	
West	8,196	20.0%	63.7%	
Level				
Elementary	24,663	60.4%	64.0%	

Did you notice? There's another difference between the 8.2 and 9.1 tables. SAS ODS output to RTF automatically places titles and footnotes in the header and footer sections of MS Word® documents. You can prevent this from happening by specifying BODYTITLE at the end of your ODS RTF statement. In Version 8.2, you could not also specify NODATE NONUMBER to suppress the date and page number in your options along with BODYTITLE. In Version 9.1, this has been fixed. The titles are now in the body of the document, and not the header.



CONCLUSION

The use of PROC TABULATE with procedure level styles in conjunction with the RTF output destination allows the SAS programmer to produce complex tables with highly controlled formatting that can be read directly into Microsoft Word. (While reading into OpenOffice has also been tested, the text rotation technique does not work at the time of publication of this paper.) The ease of table production using this method greatly adds to the SAS programmer's toolbox. It also cannot be emphasized enough that being able to reproduce professional, accurate output without error-prone interventions such as copying and pasting is vital to the SAS programmer's repertoire.

REFERENCES

SAS Online Documentation (PC SAS V8.2, AIX UNIX SAS V8.2, PC SAS V9.1)

SAS Institute Inc., *The Complete Guide to the SAS® Output Delivery System*, Version 8, Cary, NC: SAS Institute Inc., 1999. 310 pp.

Lauren E. Haworth, *PROC TABULATE by Example*, Cary, NC: SAS Institute, 1999. 392 pp.

Cindy Tong, *ODS RTF: Practical Tips*, NESUG 2003

<http://support.sas.com/rnd/base/topics/odsrtf/rtf901.html>

http://support.sas.com/rnd/base/topics/templateFAQ/Template_rtf.html

Microsoft Corporation; Rich Text Format (RTF) Specification, version 1.6
<http://msdn.microsoft.com/library/>

ACKNOWLEDGMENTS

SAS® Technical Support and R&D have been incredibly helpful, especially Wayne Hester and Bari Lawhorn.

K.P. Srinath of Abt Associates Inc., statistical sampling and SUDAAN guru.

Carolyn Robinson of Abt Associates Inc., whose work with RTF and PROC REPORT led to many insights.

Cindy Tong, author of “ODS RTF: Practical Tips”.

Lauren Haworth, author of the definitive book “PROC TABULATE By Example”.

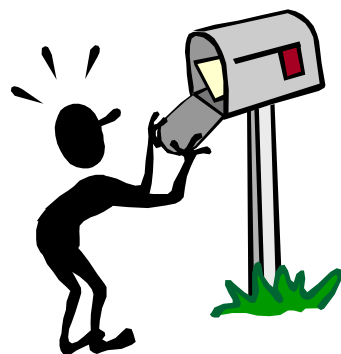
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KEYWORDS

SAS; ODS; RTF; PROC TABULATE; STYLE; TAGSET



Appendix A: Sample Program

```

options ps=48 ls=132 errorabend compress=yes;

libname dd '.';
filename odsout '.';

title1 'MHSCH00L';
footnote "Program: C:\MHSCH00L\DISTRICT\DTABLE5B.SAS - last run &sysdate9.";
run;

proc format;
    picture pctpic low-high='009.9%';
    value loccat 1='Urban'
                2='Suburban'
                3='Rural';
    value region 1='Northeast'
                2='South'
                3='Midwest'
                4='West';
run;

data anal;
    set dd.distri02;
run;

options nocenter missing=' ' orientation=landscape;

%macro do_one(source=xxx);

data temp ;
    length line $400;
    infile &source length=lg lrecl=1000 end=eof;
    input @1 line $varying400. lg;

data _null_;
    set temp ; retain mod 0 ;
    file &source;
    /* mods are done for the trow header data only */
    if (index(line,"\trowd\ttrkeep") > 0) then do ;
        if (index(line,"\trowd\ttrkeep\ttrhdr") > 0) then mod = 1;
        else mod = 0;
    end;
    if (mod) then do;
        /* this works because they are the same width */
        line=tranwrd(line,"\cltxlrb","\cltxbtlr") ;
        line=tranwrd(line,"\clvertalb","\clvertalt") ;
        line=tranwrd(line,"\qc","\ql") ;
        put line;
        /* The header cell needs to be tall enough to accept the change. */
        /* You may need to adjust this depending on what your column headers are. */
        /* Measurment is in twips. 20 twips to the point, 72 points to the inch.*/
        if ( index(line,"\trowd\ttrkeep\ttrhdr") > 0) then put "\trrh-1625" ;
    end;
    else put line ;
run;

%mend;

filename rtf 'wdtable5b.rtf';

```

```

ods rtf file=rtf path=odsout style=styles.minimal bodytitle;

proc tabulate data=anal missing format=20.
  style={bordercolor=black borderwidth=1 cellwidth=75
  font=("Times New Roman",8pt,Normal)};
  var counter mjr_idea mjr_tit1 mjr_cbgr mjr_tit4 mjr_safe mjr_sped
        mjr_sgen mjr_ttax mjr_lott mjr_locl
        mjr_mcd mjr_3rdp mjr_schi mjr_self mjr_foun mjr_othr /
  s={bordercolor=black borderwidth=2 cellwidth=75
  font=("Times New Roman",8pt,Bold)};
  weight basewgt3;
  class region loc_cat distsz3 /
  s={bordercolor=black borderwidth=2 font=("Times New Roman",8pt,Bold)};
  tables all region loc_cat distsz3,
  counter*(sum=' '*f=comma9.)
  mjr_idea*(pctsum<counter>=' '*f=pctpic.)
  mjr_tit1*(pctsum<counter>=' '*f=pctpic.)
  mjr_cbgr*(pctsum<counter>=' '*f=pctpic.)
  mjr_tit4*(pctsum<counter>=' '*f=pctpic.)
  mjr_safe*(pctsum<counter>=' '*f=pctpic.)
  mjr_sped*(pctsum<counter>=' '*f=pctpic.)
  mjr_sgen*(pctsum<counter>=' '*f=pctpic.)
  mjr_ttax*(pctsum<counter>=' '*f=pctpic.)
  mjr_lott*(pctsum<counter>=' '*f=pctpic.)
  mjr_locl*(pctsum<counter>=' '*f=pctpic.)
  mjr_mcd*(pctsum<counter>=' '*f=pctpic.)
  mjr_3rdp*(pctsum<counter>=' '*f=pctpic.)
  mjr_schi*(pctsum<counter>=' '*f=pctpic.)
  mjr_self*(pctsum<counter>=' '*f=pctpic.)
  mjr_foun*(pctsum<counter>=' '*f=pctpic.)
  mjr_othr*(pctsum<counter>=' '*f=pctpic.)
  / box={s={bordercolor=black borderwidth=2}};
  keyword all / s={font=("Times New Roman",8pt,Bold)};
  keylabel all='TOTAL';
title1 'Table 5b-Weighted';
title2 'Percentage of School Districts For Which the Source is Among Their Top
  Five Sources,';
title3 'By Selected District Characteristics: 2002-2003';
footnote1 'Source: Survey of the Characteristics and Funding of School
  Mental Health Services:';
footnote2 '2002-2003, Center for Mental Health Services, U.S. Department
  of Health and Human Services.';
footnote3 'District Questionnaire, Item 8';
run;

ods rtf close;

%do_one(source=rtf) ;

ods rtf close;

```

Appendix B – Sample Table

Table 5b-Weighted
Percentage of School Districts For Which the Source is Among Their Top Five Sources,
By Selected District Characteristics: 2002-2003

	# of Districts	Q8: IDEA Source of MH Svc Funding	Q8: Title 1 Source of MH Svc Funding	Q8: Comm MH Svcs Block Grant Source of MH Funding	Q8: Title 4 Source of MH Svc Funding	Q8: Safe Schools/Healthy Students Init Src of MH	Q8: State Special Education Funds Source of MH Svc Funding	Q8: State General Fund Source of MH Svc Funding	Q8: Tobacco Tax/Settlement Source of MH Svc Funding	Q8: Lottery Funds Source of MH Svc Funding	Q8: Local Funds (Taxes) Source of MH Svc Funding	Q8: Medicaid Reimbursement Source of MH Svc Funding	Q8: 3rd Party Payments Source of MH Svc Funding	Q8: SCHIP Source of MH Svc Funding	Q8: Self-Pay Source of MH Svc Funding	Q8: Priv Foundation Grants Source of MH Svc Funding	Q8: Other Source of MH Svc Funding 1
TOTAL	14,752	61.5%	22.3%	6.9%	52.8%	16.1%	51.5%	40.1%	5.8%	0.8%	47.1%	28.4%	4.9%	0.8%	7.5%	2.5%	10.0%
Region																	
Northeast	3,110	77.0%	17.0%	3.7%	58.2%	24.8%	54.6%	33.9%	0.8%	1.2%	71.6%	31.7%	3.7%	0.0%	7.7%	3.8%	6.9%
South	5,441	54.0%	26.1%	5.6%	53.2%	5.5%	52.7%	43.8%	2.7%	0.8%	50.0%	31.6%	4.8%	0.2%	8.1%	1.4%	9.4%
Midwest	3,330	61.3%	22.1%	7.2%	47.9%	21.3%	54.8%	42.0%	2.9%	0.3%	39.4%	26.3%	7.1%	3.2%	5.7%	1.4%	5.7%
West	2,872	59.4%	21.0%	12.1%	52.2%	21.0%	41.9%	37.6%	20.6%	1.1%	23.9%	21.2%	4.0%	0.0%	8.3%	4.3%	19.6%
Urbanicity																	
Urban	2,003	64.8%	35.1%	5.1%	47.5%	19.7%	57.8%	38.8%	9.0%	0.7%	38.5%	28.3%	4.5%	0.0%	6.4%	7.7%	12.2%
Suburban	4,773	64.8%	16.7%	6.0%	54.9%	14.4%	55.7%	38.1%	6.4%	1.7%	54.6%	32.4%	3.8%	1.0%	4.8%	2.9%	11.7%
Rural	7,976	58.7%	22.4%	7.8%	53.0%	16.3%	47.3%	41.7%	4.7%	0.3%	44.7%	26.0%	5.7%	0.9%	9.4%	0.9%	8.5%
District Size																	
1-5 Schools	10,651	56.9%	24.5%	5.1%	52.4%	15.6%	50.4%	38.9%	6.1%	0.2%	47.1%	25.4%	3.1%	0.6%	7.8%	2.3%	9.9%
6-15 Schools	3,100	73.0%	13.5%	10.0%	53.3%	15.4%	52.6%	43.0%	4.3%	2.4%	49.5%	36.1%	10.1%	1.2%	7.3%	2.6%	10.7%
16+ Schools	1,001	75.8%	25.7%	15.1%	56.5%	23.7%	59.2%	43.9%	8.2%	2.8%	39.3%	36.2%	8.0%	1.2%	4.7%	3.1%	9.6%

Source: Survey of the Characteristics and Funding of School Mental Health Services:
2002-2003, Center for Mental Health Services, U.S. Department of Health and Human Services.
District Questionnaire, Item 8