

## How to Create Sub-sub Headings in PROC REPORT and Why You Might Want to: Thinking about Non-traditional Uses of PROC REPORT

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### ABSTRACT

Often a statistician or programmer has a report in mind that they would like to generate through PROC REPORT. Additionally they might also like to automate it through SAS macro techniques. They go to the literature and do not find examples close to what they would like to produce. However, they do find things that they can piece together to create the report that they want to see. This paper outlines a specific example of going this route. This paper outlines one non-traditional use of some PROC REPORT techniques to achieve sub-sub headings throughout the body of a report. Often the literature shows breaks, headings or summaries one time at the beginning or end of a report. One can also find examples of subheadings inserted into the body of a report whenever the value of a compute block variable changes within PROC REPORT, but the subheadings, breaks or summaries are not dynamic and the compute block variable must be in the analysis dataset. However, you can utilize these techniques along with the \$varying format and SAS<sup>®</sup> macro techniques to achieve dynamic sub-sub headings in any report. This paper will walk through the process and the end result.

### INTRODUCTION

It is often desired to add sub-headings and/or sub-sub headings throughout the body of a report. Examples might be creating a table in which one would like to delineate with sub-headings things such as “Demographic Variables” or “Computed Scales” as two examples. Additionally, it is often desired to add sub-sub headings to further delineate and organize a table such as under “Demographics” one might want to further delineate “From Administrative Data” and “From Survey.” Another example might be further delineating “Computed Scales” into “Imputed” and “Non-Imputed” or “Baseline,” “3 Month” and “6 Month.” These types of enhancements allow for a finer level of organization which can enhance communication and minimize confusion when communicating with reports.

Until now, the literature does not appear to offer a paper on 'How to create Sub-sub Headings in the Body of your Report Using PROC REPORT', however there are helpful things one can find and then piece together to create the desired effect. First, in the literature if you search for subheadings throughout the body of a report using PROC REPORT you will find some information mainly in the following areas: spanned headers (Booth), super-headers (Campbell), stacking headers, compute block capabilities, and one article on creating sub headings that isn't very specific (Prust). Most are irrelevant to what we are looking to do especially the first three. Many of the compute block articles focus on adding just one header, summary or break at the beginning or end of a report or whenever the value of the compute block variable changes which requires you to have this variable in your original dataset. Examples of one or many non-dynamic sub headings can be found in Carpenter, Cochran, Eslinger and Hamilton. Being non-dynamic, this will only work if you want the exact same sub heading inserted at various points throughout your report. For example, it will repeat the word “Demographics” all the way through.

This paper adds to the current literature in a significant way in that we show you how to create dynamic subheadings in case this isn't clear and how to create dynamic sub-sub headings. The examples will be shown within the context of a data dictionary macro; however, the subheading and sub-sub heading techniques can be used in any report. The first page of output from the data dictionary macro which shows both subheadings and sub-sub headings is shown in APPENDIX A. “Demographics” is a subheading and “Admin\_Demographics” and “Survey\_Demographics” are sub-sub headings.

## REVIEW: HOW TO CREATE DYNAMIC SUBHEADINGS

### 1. Start with compute block techniques for making non dynamic subheadings.

As can be readily found in the literature, here we utilize compute block techniques to achieve non-dynamic subheadings throughout the body of a report. The following code will insert the word "Demographics" wherever the value of age changes. Note that the age variable must be listed as a group or order variable in PROC REPORT before this step.

```
compute before age/ style=header[just=c fontsize=13pt fontweight=bold];
length txtline $50;
txtline="Demographics";
line txtline $50.
endcomp;
```

### 2. Adjust that to create dynamic subheadings.

To make this dynamic we can add in macro techniques. An example of how one can set up the macro parameters is shown in Appendix B.

```
compute before age/ style=header[just=c fontsize=13pt fontweight=bold];
length txtline $50;
%do i = 1 %to &gnumb;
if cate in (&i) then do;
txtline="&&heads22&i"; end;
%end;
line txtline $50.;
endcomp;
```

## HOW TO CREATE SUB-SUB HEADINGS THROUGHOUT THE BODY OF A REPORT

If you simply repeat the process for subheadings to create sub-sub headings it will not work because SAS® will automatically make a sub-sub heading anywhere that you also have a subheading. First we need to combine our subheading compute block variable with our sub-sub heading compute block variable creating a new compute block variable. In this example the subheading variable 'cate' was multiplied with the sub-subheading variable 'newcat' to make a new variable called 'sescat.' Since this new variable contains information about both the subheadings and sub-subheadings (where you want them), we can use that along with the \$varying format within the compute block to tell SAS® where not to put sub-sub headings. This requires us to use both the sub-sub heading variable and the newly created variable to tell it to write out the sub-sub headings only where we specify and not anywhere else. This makes the text line length zero where you don't want a sub-sub heading and this will ensure that a sub-sub heading will not appear automatically where there is a subheading. The entire process can be automated through SAS® macro techniques. The macro parameters input for this data dictionary example can be found in Appendix B and the output of this same data dictionary macro in Appendix A.

```
compute before sescat/ style=Header[just=l fontsize=11pt];
length txtline $50;
%do i = 1 %to &subnumhead;
if sescat in (&&gvvarlist&i) then do;
txtline="&&heads228&i";
if sescat=%scan(&gsescat22,&i) then lg=length(txtline); else lg=0; end; %end;
line txtline $varying. lg;
endcomp;
```

## CONCLUSION

When looking for a SAS or PROC REPORT solution we often go to the internet expecting to find a SAS paper with the title we want such as ‘ How to Create Sub and Sub-Sub Headings throughout the body of a report using PROC REPORT.’ When we don’t, we should not stop there. Finding a creative solution with what can be found is often an option.

## REFERENCES

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*Small portion of VA data shown with permission.*

## CONTACT INFORMATION

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## APPENDIX A

### Data Dictionary SPACE Analysis Dataset

Date Created: 30AUG2016

Datasetname: anls28

Number of Observations: 264

Number of Variables: 65

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	Variable	Type	Length	Format	User Defined Format?	Label
<b>Demographics</b>						
Admin_Demographics						
1	<b>age_a</b>	Num	4			Age
2	<b>gender_a</b>	Num	8	GE	yes	<b>Gender</b> 1=female 2=male
3	<b>primarypainlocation</b>	Num	8	FPL	yes	<b>PrimaryPainLocation</b> 1=Back Pain 2=Knee or Hip Pain
4	<b>treatmentgroup</b>	Num	8	FTX	yes	<b>TreatmentGroup</b> 0=Opioid - Intensive 1=Opioid - Avoidant
Survey_Demographics						
5	<b>race</b>	Num	8	RACE	yes	<b>Race</b> 1=White 2=Black/AfAmer 3=Asian 4=Native Amer/Alaska 5=Native Hawaii/Pacific 6=Hispanic/Latino 7=Multiple
6	<b>education</b>	Num	8	ED	yes	<b>Education level</b> 1=< 4 yr degree 2=4 yr degree +
7	<b>employment</b>	Num	8	EMP	yes	<b>Employment Status</b> 1=employed for wages 2=self employed 3=retired 4=other

## APPENDIX B

```
%amydatadict(  
dataset=anls28,  
lib=stat,  
numvar=65,  
sstart=1 8 14 19 30 32 34 38 40 49 60,  
sstop=7 13 18 29 31 33 37 39 48 59 65,  
headt=Demographics Admin_Dx Survey_Drug_Alc Survey_Scales Survey_Symptoms  
PMAQ Cold_Pressor Chair_Test Gait Hand_Grip Other,  
numhead=11,  
subsstart=1 5,  
subsstop=4 65,  
subheadt=Admin_Demographics Survey_Demographics,  
subnumhead=2,  
skipformat=9 10 11 12 63,  
title=Data Dictionary SPACE Analysis Dataset,  
filepathname=G:\Project_Analysis\Krebs_SPACE\Programs\SAS\playupdatemacrodd\  
output\spacedraft223ssNEXT.rtf); run;
```

<b>dataset</b>	the dataset you want to create a data dictionary for
<b>lib</b>	the library where the permanent formats are stored
<b>numvar</b>	the number of variables in your dataset
<b>sstart</b>	the number of the variable where you want a subheading to start above
<b>sstop</b>	the number of the variable where you want the subheading to end
<b>headt</b>	in order with spaces between write out the words you want in your sub headings
<b>numhead</b>	the number of sub headings that you want
<b>subsstart</b>	where you want your sub-sub headings to start
<b>subsstop</b>	where you want your sub-sub headings to end
<b>subheadt</b>	in order with spaces between write out the words you want in your sub-sub headings
<b>subnumhead</b>	the number of sub-sub headings you want
<b>skipformat</b>	list the variable number for any variable that you don't want the formatted values listed
<b>title</b>	the title of the data dictionary
<b>filepathname</b>	where you want the final outputted dataset to reside with .rtf at the end