

A Program for Facilitating Survey Item Comparisons*

Paul Pope, Texas Agricultural Extension Service, Texas A&M University System

ABSTRACT

This paper presents an application of SAS' macro processing capabilities to rearrange variables in a PROC MEANS table so that variables appear in descending or ascending order by a specified statistic, thus facilitating survey item comparisons.

INTRODUCTION

A PROC MEANS table provides a compact presentation of elementary statistics for a set of variables. However, as the number of variables in the table increases, it becomes increasingly laborious to compare variables by a statistic of interest (e.g. mean). This is due to the fact that variables appear in the order that they are listed in the VAR statement of PROC MEANS. The program presented in this paper uses an initial PROC MEANS to determine the order that variables should appear and uses SAS' macro processing capabilities to perform another PROC MEANS with variables (in the VAR statement) listed in the desired order.

The following survey question, with a set of related items, will be used to demonstrate the program:

Q8. TO WHAT EXTENT DO THE FOLLOWING PREVENT YOU FROM HUNTING MORE OFTEN IN TEXAS? (please circle the number that indicates how important each item is to you)

	not at all important	slightly important	moderately important	very important	extremely important
a. Lack of interest	1	2	3	4	5
b. Scarcity of game	1	2	3	4	5
c. No place to hunt	1	2	3	4	5
d. Too many hunters where I hunt	1	2	3	4	5
e. Involved in other recreational activities	1	2	3	4	5
f. Not enough time due to family commitments	1	2	3	4	5
g. Equipment/supplies too expensive	1	2	3	4	5
h. Personal health/age	1	2	3	4	5
i. Lease cost too high	1	2	3	4	5
j. Not enough time due to work	1	2	3	4	5
k. Land access restrictions	1	2	3	4	5
l. Poachers/unethical hunters in the woods	1	2	3	4	5
m. Must drive too far	1	2	3	4	5
n. Hearing negative comments about hunters	1	2	3	4	5
o. Fear of personal danger	1	2	3	4	5
p. Friends no longer hunt as often	1	2	3	4	5

THE PROGRAM

Responses to Q8A-Q8P range from 1 to 5. For the purpose of comparing items A through P in terms of importance, lets say you want to rearrange the PROC MEANS table in descending mean order. Use this program:

```
PROC MEANS DATA=HUNTER.HUNTER NOPRINT;
  VAR Q8A--Q8P; OUTPUT OUT=TEMPFILE MEAN=;

PROC TRANSPOSE DATA=TEMPFILE(DROP=_FREQ_ _TYPE_) OUT=TEMPFILE;
PROC SORT;
  BY DESCENDING COL1; /*COMMENT THIS LINE AND UNCOMMENT THE NEXT LINE FOR ASCENDING ORDER */;
  *BY COL1;

DATA _NULL_; SET TEMPFILE;
  CALL SYMPUT('VARS' || LEFT(_N_), _NAME_); CALL SYMPUT('LAST', _N_);

%MACRO STATSORT;
TITLE1 'COMPARISON OF ITEM IMPORTANCE';
TITLE2 'IN DESCENDING MEAN ORDER';
PROC MEANS DATA=HUNTER.HUNTER MEAN MAX MIN STD MAXDEC=2;
  VAR %DO I=1 %TO &LAST; &&VARS&I %END; ; RUN;
%MEND STATSORT;
%STATSORT
```

How does it work? First, the initial PROC MEANS outputs a file called TEMPFILE. It contains a single observation with the internal variables _TYPE_ and _FREQ_ and the mean value for each variable. It looks like this:

OBS	_TYPE_	_FREQ_	Q8A	Q8B	Q8C	Q8D	Q8E	Q8F	Q8G	Q8H	Q8I	Q8J	Q8K	...
1	0	588	4.33	3.75	2	1.25	3.5	4.5	2	2.75	2.5	4.17	4.43	...

PROC TRANSPOSE transposes TEMPFILE and drops the _TYPE_ and _FREQ_ variables with the following result:

OBS	_NAME_	_LABEL_	COL1
1	Q8A	LACK OF INTEREST	4.33
2	Q8B	SCARCITY OF GAME	3.75
3	Q8C	NO PLACE TO HUNT	2.00
4	Q8D	TOO MANY HUNTERS	1.25
5	Q8E	OTHER RECREATIONAL ACTIVITIES	3.50
6	Q8F	FAMILY COMMITMENTS	4.50
7	Q8G	EQUIPMENT/SUPPLIES EXPENSE	2.00
8	Q8H	PERSONAL HEALTH/AGE	2.75
9	Q8I	LEASE COST TOO HIGH	2.50
10	Q8J	WORK	4.17
11	Q8K	LAND ACCESS RESTRICTIONS	4.43
12	Q8L	POACHERS/UNETHICAL HUNTERS	2.00
13	Q8M	MUST DRIVE TOO FAR	2.50
14	Q8N	NEGATIVE COMMENTS ABOUT HUNTERS	2.75
15	Q8O	FEAR OF PERSONAL DANGER	2.00
16	Q8P	FRIENDS NO LONGER HUNT	3.25

PROC SORT sorts TEMPFILE in descending mean order:

OBS	_NAME_	_LABEL_	COL1
1	Q8F	FAMILY COMMITMENTS	4.50
2	Q8K	LAND ACCESS RESTRICTIONS	4.43
3	Q8A	LACK OF INTEREST	4.33
4	Q8J	WORK	4.17
5	Q8B	SCARCITY OF GAME	3.75
6	Q8E	OTHER RECREATIONAL ACTIVITIES	3.50
7	Q8P	FRIENDS NO LONGER HUNT	3.25
8	Q8H	PERSONAL HEALTH/AGE	2.75
9	Q8N	NEGATIVE COMMENTS ABOUT HUNTERS	2.75
10	Q8I	LEASE COST TOO HIGH	2.50
11	Q8M	MUST DRIVE TOO FAR	2.50
12	Q8C	NO PLACE TO HUNT	2.00
13	Q8G	EQUIPMENT/SUPPLIES EXPENSE	2.00
14	Q8L	POACHERS/UNETHICAL HUNTERS	2.00
15	Q8O	FEAR OF PERSONAL DANGER	2.00
16	Q8D	TOO MANY HUNTERS	1.25

Within the DATA _NULL_ step, two CALL SYMPUT statements are utilized. The first creates a macro variable, VARS_n, for each observation in TEMPFILE. The name of the macro variable is the string 'VARS' concatenated with the value of data step variable _N_. The value of _NAME_ (the variable name) is assigned to the macro variable. So, for first observation, a macro variable called VARS1 is created with an assigned value of Q8F. For the second observation, a macro variable called VARS2 is created with an assigned value of Q8K, and so on (see the SAS Guide to Macro Processing (1986) for more details on this use of CALL SYMPUT). The second CALL SYMPUT statement creates the macro variable LAST, assigned the value of _N_. The value of LAST, then, will eventually equal the number of observations (16). This value is used in the DO loop contained in the final PROC MEANS.

In the final PROC MEANS, specify all of the statistics and parameter you require (as with any other PROC MEANS). The DO loop produces the variable list in the desired order (by descending mean). The macro processor must scan twice in order to resolve the &&VAR&I reference. The result is:

```
PROC MEANS DATA=HUNTER.HUNTER MEAN MAX MIN STD MAXDEC=2;
  VAR Q8F Q8K Q8A Q8K Q8B Q8E Q8P Q8H Q8N Q8I Q8M Q8C Q8G Q8L Q8O Q8D;
RUN;
```

For more details on scanning macro variable references, refer to the SAS Guide to Macro Processing (1986).

The result of the program is seen below (variables listed in descending mean order):

COMPARISON OF ITEM IMPORTANCE IN DESCENDING MEAN ORDER						
N Obs	Variable	Label	Minimum	Maximum	Mean	Std Dev
588	Q8F	FAMILY COMMITMENTS	4.00	5.00	4.50	0.48
	Q8K	LAND ACCESS RESTRICTIONS	4.00	5.00	4.43	0.73
	Q8A	LACK OF INTEREST	4.00	5.00	4.33	1.20
	Q8J	WORK	4.00	5.00	4.17	1.10
	Q88	SCARCITY OF GAME	2.00	5.00	3.75	1.39
	Q8E	OTHER RECREATIONAL ACTIVITIES	2.00	5.00	3.50	1.60
	Q8P	FRIENDS NO LONGER HUNT	3.00	4.00	3.25	0.46
	Q8H	PERSONAL HEALTH/AGE	2.00	3.00	2.75	0.46
	Q8N	NEGATIVE COMMENTS ABOUT HUNTERS	1.00	5.00	2.75	1.91
	Q8I	LEASE COST TOO HIGH	2.00	3.00	2.50	0.53
	Q8M	MUST DRIVE TOO FAR	1.00	4.00	2.50	1.60
	Q8C	NO PLACE TO HUNT	1.00	3.00	2.00	0.76
	Q8G	EQUIPMENT/SUPPLIES EXPENSE	2.00	2.00	2.00	0.00
	Q8L	POACHERS/UNETHICAL HUNTERS	2.00	2.00	2.00	0.00
	Q8O	FEAR OF PERSONAL DANGER	1.00	4.00	2.00	1.31
	Q8D	TOO MANY HUNTERS	1.00	2.00	1.25	0.46

Now, at a glance, one can see the items that were rated as most and least important to the respondents. The table can be sorted by any statistic available under PROC MEANS.

REFERENCES

SAS Institute, Inc. (1986), *SAS Guide to Macro Processing, Version 5 Edition*. Cary, NC: SAS Institute, Inc.

SAS is a registered trademark or trademark of SAS Institute Inc. in the USA and other countries.

® indicates USA registration.

* This paper describes an application of a program developed for the author by SAS Technical Support (with modifications made by the author).

The author encourages you to share your experiences, evaluations, or comments concerning the concepts and applications presented in this paper:

Paul Pope
Texas Agricultural Extension Service
112A Special Services Bldg.
College Station, TX 77843-2468
Phone: (409) 845-3929
Internet: p-pope@tamu.edu