Block 3: Analysing two variables (and sometimes three) De

Derived variables

3.5.2.3 The COUNT command 1 - Attachment to status quo

[Last updated: 24 Aug 2011, previous version 1 October 2009]

Exemplar:	Fifth form survey <u>fifthx.sav</u>
Variables:	v275 to v278 (Q34 o, p, q, r)
Variable to be derived:	Attachment to status quo
SPSS command:	COUNT
Previous tutorial	3.5.2.2 Data checks 1 - Status quo

As well as the basic variables defined during the file-creation stage, we have already seen how to create new or **derived** variables with the **RECODE** ... **INTO** ... and **RENAME VARIABLES** commands and with the **GET**.... **/RENAME** sub-command.

It is also possible to create new variables by combining information from two or more existing variables, by copying from one variable to another, or even by overwriting the same variable.

First, let's look at how we can create a new variable by **counting** the number of times a value or set of values occurs in a given set of variables.

The **COUNT** command

COUNT creates additive indices. It counts, for each case, the number of times a specified value or set of values occurs for a variable or variables on a criterion variable list and enters this as the value for a new variable defined by the **COUNT** command.

The general format is:

COUNT <newvar> = <criterion varlist> (<value list>)

...in which the user has to supply the new variable name, the list of variables to be scanned and the list, including the round brackets, of value(s) to be included in the search and where <value list> must contain a single value, several individual values separated by commas or a range of values.

e.g. **COUNT** Q34_Disagree = v275 to v278 (1, 2)

This creates a new variable Q34_Disagree initialized at 0: SPSS scans the four variables v275 to v278 and adds 1 each time it finds a 1 or a 2, to yield a score in the range 0 - 4. The new variable is appended to the bottom of the working file, but will not be saved unless you also save the file.

For example, in the fifth form survey, four items in question Q.34 (o, p, q, r) are replicated from a scale developed by Himmelweit to measure "attachment to status quo" among teenagers.

annell (1) and a film of the	Disagree Strongly	Tend to Disagree	Tend to Agree	Agree Strongly	
o) It is best to be like the others and not to stand out from the rest.	³ 1	2	3	4	(75
p) People who are content with what they have will have a better life than those who are always trying to improve their position	1	2	3	4	(76)
1) We are all born to our various social positions and it won't do to change them.	1	2	3	4	(77)
r)The greatest source of happiness in life is to be satisfied with whatever you have.	1	2	3	4	(79)

We can construct a crude index of this attitude by counting the number of "**agree**" or "**agree** strongly" responses (codes 3 or 4) to these items. The result will lie in the range 0 to 4 where 4 indicates high attachment to the status quo.

To use **COUNT** to generate a new variable containing the number of **Agree** or **Agree Strongly** responses (codes 3 and 4) to the items in the "Attachment to status quo" scale, we first need to decide on a name for it.

Remember, variable names in SPSS must begin with a letter of the alphabet. In 1981 they were limited to 8 characters, but now you can have up to 64. However, it's best to keep names short as otherwise the Data Editor gets very unwieldy. Let us call the new variable **STATQUO**. Next, we have to specify the existing variables to be included in the criterion list for **STATQUO**. These are **V275 V276 V277** and **V278**.

A small table helps:

New variable name <newvar></newvar>	Variables to be scanned <criterion varlist=""></criterion>	Values to be counted <value list=""></value>
STATQUO	V275 V276 V277 V278	3 and 4

Using the general format as a guide:

COUNT <newvar> = <criterion varlist> (<value list>)

in which **blue** indicates required **SPSS keywords and symbols** and **plum** things you have to **type in yourself**, we can write a command in SPSS:

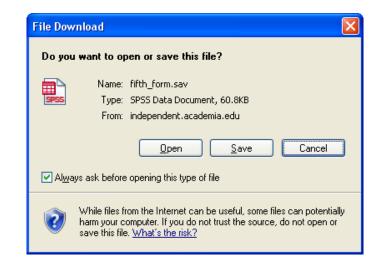
COUNT STATQUO = V275 V276 v277 V278 (3, 4).

...or, because the source variables are adjacent in the file,

COUNT STATQUO = V275 TO V278 (3, 4).

First we need to access the SPSS saved file for the fifth form survey. You may already have the file open from the last tutorial: if not, start by downloading <u>fifthx.sav</u> (the SPSS saved file for the fifth form survey). Don't worry if you haven't got immediate access to SPSS, just follow the rest of the tutorial anyway

[NB: The file name in the following screenshots is **fifth_form.sav**, to be downloaded from a different website before October 2009, but the file is now on this website and contains the same data. It now downloads directly into SPSS, or opens SPSS if it is not already open.]



Click on **Open** to get¹:

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2	v106	Numeric	2	0	Q.1 First Subj	{1,Human Bi	-1,23,24	8	Right	Ordinal	1			
3	v107	Numeric	2	0	Q.1 Second S	{1,Human Bi	-1,23,24	8	Right	Ordinal				
4	v108	Numeric	2	0	Q.1 Third Subj	{1,Human Bi	-1,23,24	8	Right	Ordinal	1			
5	v109	Numeric	2	0	Q.1 Fourth Su	{1,Human Bi	-1,23,24	8	Right	Ordinal	1			
6	v110	Numeric	2	0	Q.2 Anticipate	{1,16}	-1,23,24	8	Right	Ordinal	1			
7	v111	Numeric	2	0	Q.3 Anticipati	{1, Yes}	-1,23,24	8	Right	Ordinal				
8	v112	Numeric	2	0	Q.4 Expected	None	-1	8	Right	Ordinal	1			
9	v114	Numeric	2	0	Q.5 Anticipate	{1, Profess-ion	-1,23,24	8	Right	Ordinal	1			
10	v116	Numeric	2	0	Q.6 Liklihood	{1, Not very lik	-1,23,24	8	Right	Ordinal	~			
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For now we don't need the last three columns. Use the mouse to drag the column separators for **Labels** and **Values** to the right to make the display easier to read, and to include only essential information (as far as **Missing**) then adjust the size of the pane to suit.

¹ The size of the Data Editor displayed will depend on how it was last used. You can drag the corners of the pane to reduce or enlarge it, and the edges up or down and left or right using the left mouse button. This pane is adjusted to display only the first few variables in the file.

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2 v106	Numeric	2	0	Q.1 First Subject	{1, Human Biology}	-1, 23, 24					
3 v107	3 v107 Numeric 2 0 Q.1 Second Subject {1, Human Biology}1, 23, 24										
4 v108	Numeric	2	0	Q.1 Third Subject	{1, Human Biology}	-1, 23, 24					
5 v109	Numeric	2	0	Q.1 Fourth Subject	{1, Human Biology}	-1, 23, 24					
6 v110	Numeric	2	0	Q.2 Anticipated age of leaving school	{1, 16}	-1, 23, 24					
7 v111	Numeric	2	0	Q.3 Anticipating Further Education	{1, Yes}	-1, 23, 24					
8 v112	Numeric	2	0	Q.4 Expected Completion of Further Ed	None	-1					
9 v114	Numeric	2	0	Q.5 Anticipated Job	{1, Profess-ional}	-1, 23, 24	_				
10 v116	Numeric	2	0	Q.6 Likelihood of Anticipated Job	{1, Not very likely}	-1, 23, 24					
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Scroll down to find variables v275 to v278 containing the data for the battery of items measuring attachment to status quo, Q34 o, p, q and r, and adjust the pane further vertically to reduce clutter and show only these variables:

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	138	v275	Numeric	2	0	Q.34o Shouldn't be conspicuous	{1, Strongly disagree}	-1, 23, 24					
	139	v276	Numeric	2	0	Q.34p Contentment brings better life	{1, Strongly disagree}	-1, 23, 24					
	140	v277	Numeric	2	0	Q.34q Social positions fixed	{1, Strongly disagree}	-1, 23, 24					
	141	v278	Numeric	2	0	Q.34r Happiness is satisfaction	{1, Strongly disagree}	-1, 23, 24	~				
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Now you know why positional variable names and informative variable labels are so useful! The variables and question numbers are much easier to find inside the Data Editor than mnemonics and you (and, more important, other researchers) can work straight from the original questionnaire to the data set and *vice versa*. If you must use mnemonics, at least consider using the question numbers as variable names for the same reason, especially if you are using the GUI drop-down menus with variables displayed in alphabetical order.

To create our new variable **STATQUO** (attachment to status quo) we wrote a command in SPSS syntax:

COUNT STATQUO = V275 V276 v277 V278 (3, 4).

How do we get SPSS to execute this command?

It is possible, but **extremely tedious, confusing and tiresome**, to do this using the drop-down menus. In my experience it is much simpler, quicker and easier to do it directly using SPSS syntax. You will see why later.

The syntax way

Go back to the Data Editor:

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139	v276	Numeric	2	0	Q.34p Contentment brings better life	{1, Strongly disagree}.	-1,23,24	_					
140	v277	Numeric	2	0	Q.34q Social positions fixed	{1, Strongly disagree}.	-1,23,24						
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...and write in your SPSS command:

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count statquo = v275 v276 v277 v278 (3,4).	^
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Don't forget the full stop! Leave the cursor in or on the line and run the job with [CTRL]+R or

Run ...Current

Nothing appears to happen, but if you go back to the data editor:

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139	v276	Numeric	2	0	Q.34p Contentment brings better life	{1, Strongly disagree}	-1, 23, 24	
140	v277	Numeric	2	0	Q.34q Social positions fixed	{1, Strongly disagree}	-1, 23, 24	
141	v278	Numeric	2	0	Q.34r Happiness is satisfaction	{1, Strongly disagree}	-1, 23, 24	~
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..and scroll down to the end:

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231	STATQUO	Numeric	8	2		None	None	-
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STATQUO has now been defined and the name appended: if you click on **Data View** then **[CTRL] + ►** to see the last column, you will see that no values have been calculated yet.

🔛 *FIFT	HX.SAV [Da	taSet1] - SPS	SS Data Edite	or					
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140	-1	-1	2	-1	-1	-1	-1		
141	4	6	1	-1	-1	-1	-1		
142	-1	-1	1	-1	-1	-1	-1		
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This is because SPSS is waiting for a statistical command such as **FREQUENCIES** or for an interim **EXECUTE**. Go back to the syntax file and type **EXECUTE** on the next line.

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count statquo = v275 v276 v277 v278 (3,4). execute.	< >							
SPSS Processor is ready								

Don't forget the full stop. Leave the cursor in or on the line and click on **Run..Current** or **[CTRL]+R** to run the command.

Now check the Data Editor again:

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140	-1	-1	2	-1	-1	-1	-1	1.00	
141	4	6	1	-1	-1	-1	-1	2.00	
142	-1	-1	1	-1	-1	-1	-1	1.00	
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Scores have been entered, but we don't actually need two decimal places for the integer variable **STATQUO** so the file can be tidied up by clicking on **Variable View**

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...and manually changing 2 to 0 in the Data Editor **Decimals** column for **STATQUO**.

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or by using the **FORMAT** command:

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count statquo = v275 to v278 (3 , 4) . format statquo (f1.0). execute.	
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SPSS Processor is ready	

...and running the job again.

Although the **STATQUO** column has now filled up with scores generated by **COUNT**, if you go back to **Variable View** there is nothing to tell you (or other users) what **STATQUO** is, so it needs a label.

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230	v430	Numeric	2	0		{0, None}	-1, 23, 24	E
231	statquo	Numeric	8	0		None	None	
232								
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You can write a label directly into the **Data Editor** (easy for just one variable) but if you have a large number of variables it's better to use syntax.

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Syntax is much easier to edit, especially if you use Word to compose it. Remember, you can use lower case and abbreviations for commands and subcommands. SPSS normally only reads the first 3 or 4 characters anyway. So for **VARIABLE LABELS** you can simply write **var lab**. You soon get used to it and you're less likely to get RSI²!

😫 statquo - count - SPSS Syntax Editor	
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count statquo = v275 to v278 (3 , 4) . format statquo (f1.0). execute.	
var lab statquo 'Q.34 Status quo [count]'.	~
SPSS Processor is ready	

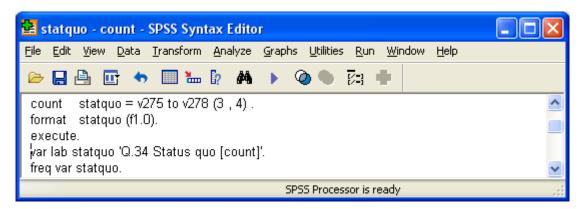
Run the command to get:

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	Name	Туре	Width	Decimals	Label	Values	Missing	
230	v430	Numeric	2	0		{0, None}	-1, 23, 24	
231	STATQUO	Numeric	1	0	Q.34 Status quo [count]	None	None	~
Image: A to	Data View Variable View							
	SPSS Processor is ready							

So far, so good. The new variable **STATQUO** has been created as an integer (no decimal places) at the end of the file, together with a descriptive label. but we still need an analysis to check what the distribution looks like.

² Repetitive Strain Injury

A simple frequency count will do. Again, it is sufficient to write freq instead of FREQUENCIES



Run the command to produce:

Statistics

Q.34 Agreement with items o,p,q,r.

Ν	Valid	142
	Missing	0

Attachment to status quo

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	20.4	20.4	20.4
	1	33	23.2	23.2	43.7
	2	48	33.8	33.8	77.5
	3	28	19.7	19.7	97.2
	4	4	2.8	2.8	100.0
	Total	142	100.0	100.0	

We have just produced a new variable **STATQUO** (a score of attachment to the status quo developed for teenagers by Himmelweit) with values in the range 0 to 4.

We still need to think about how to deal with the problem of missing values which are coded as '-1' for all items on Q.34 and which have already been declared as missing in the file.

SPSS ignores these when using **COUNT** and can therefore give misleading results. It is potentially inaccurate because it gives a **STATQUO** score to every case even if one or more constituent items is missing. Thus a score of 2 could indicate agreement with any two items out of two to four replies. Moreover, this measure is quite crude because it only takes into account information from half the response on each item in the scale. Because some pupils have not answered some or all of the items, any score for them may not be a "true" score. For simplicity and accuracy we really ought to leave these pupils out of the analysis.

It is possible to leave out pupils with missing items by counting the number of items with missing values and then selecting out only those pupils with no items missing.

With **COUNT** you'd have to do something like:

COUNT X=V275 to v278 (MISSING). SELECT IF (X EQ 0). ...before tabulating the **STATQUO** score, but, as with data all transformations (unless you use **TEMPORARY**) you need to be **very careful** you don't inadvertently make them permanent. If you save the **Data Editor** use a different name: that way the original file remains intact.

😫 Syntax1 - SPSS Syntax Editor 📃 🗖 🔀								
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>D</u> ata <u>T</u> ransform <u>A</u> nalyze <u>H</u> elp	<u>G</u> raphs <u>U</u> tilities <u>R</u> un <u>W</u> indow							
🗁 📑 🎒 📴 🦘 🗐 🔚 🧗 🖊) 🖉 🌢 🕅 🔸							
temp. count x = v275 to v278 (missing). select if x = 0. freq statquo.								
	SPSS Processor is ready							

Run this set of commands to produce:

Statistics

Q.34 Agreement with items o,p,q,r.

Ν	Valid	106
	Missing	0

Q 34 Agreement with items o,p,q,r

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	10	9.4	9.4	9.4
	1	26	24.5	24.5	34.0
	2	38	35.8	35.8	69.8
	3	28	26.4	26.4	96.2
	4	4	3.8	3.8	100.0
	Total	106	100.0	100.0	

..from which we see that our sample has been drastically reduced from 142 to 106. In other words only 106 out of 142 pupils answered all four items.

Because **STATQUO** is an interval scale variable (actually a ratio scale because it has a true zero point) it can legitimately be used in statistical procedures like **MEANS**, **T-TEST**, **ONEWAY** and **CORRELATION**. This is methodologically risky for reasons which were explained above.

With such a small sample, we can't do much anyway, but it suffices as a learning exercise.

The point-and-click way

If you prefer, you can generate **STATQUO** using the drop-down menus instead, but it takes a lot longer. Go back to the Data editor:

53 *	🔹 *fifth form.sav [DataSet2] - SPSS Data Editor								
Eile	<u>E</u> dit	⊻iew	<u>D</u> ata <u>T</u> ra	ansform	<u>A</u> naly	ze <u>G</u> raphs <u>U</u> tilities <u>W</u> indow <u>H</u> elp			
⊜	😕 🖬 🖬 🚸 🥐 🀜 🖗 🌾 🏥 🏛 🎆 🥸 🎆 🥸 🚳 🖌								
		Name	Туре	Width	Deci	Label	Values	Missing	^
	138	v275	Numeric	2	0	Q.34o Shouldn't be conspicuous	{1, Strongly disagree}.	-1, 23, 24	
	139	v276	Numeric	2	0	Q.34p Contentment brings better life	{1, Strongly disagree}.	-1,23,24	-
	140	v277	Numeric	2	0	Q.34q Social positions fixed	{1, Strongly disagree}.	-1, 23, 24	
	141	v278	Numeric	2	0	Q.34r Happiness is satisfaction	{1, Strongly disagree}.	-1,23,24	~
∎₽	Data View Variable View								
						SPSS Processor is ready			

Transform

...Count values within cases

Count Occurrences of Values within Cases					
Target Variable:		Target <u>L</u> abel:		ок	
🔗 Serial number of gu 🔨		⊻ariables:		Paste	
📲 Q.1 First Subject [[<u>R</u> eset	
📲 Q.1 Second Subje			í	Cancel	
📲 Q.1 Third Subject	Ľ		ļ	Lancer	
📲 Q.1 Fourth Subjec				Help	
📲 Q.2 Anticipated ag					
📲 Q.3 Anticipating F		Define Values			
Q.4 Expected Cor					
📲 Q.5 Anticipated Jc 👽		If (optional case selec	ction condition)		

As before, scroll down to find items Q.34o to Q.34r

Count Occurrences of Values within Cases					
Target Variable:		Target <u>L</u> abel:		OK	
📲 Q.34o Shouldn't be 🔨		Variables:	1	Paste	
Q.34p Contentmer Q.34q Social positi				<u>R</u> eset	
0.34r Happiness is 0.35a Fiddling Soc	Ľ			Cancel Help	
👖 Q.35b Fiddling fare 🚍				Treip	
4.35c Fiddling tax 4.35d Buying stole		Define Values			
📲 Q.35e Taking and 🔽		[<u>]f</u>] (optional case sele	ction condition)		

...highlight them

Count Occurrences of Values within Cases					
<u>T</u> arget Variable:	Target <u>L</u> abel:	ОК			
Q.34j War is huma Q.34k Royal Wedd Q.34k Royal Wedd Q.34l Guns for poli Q.34m Ban Nuclee Q.34n YOP a wast Q.34o Shouldn't be Q.34p Contentmer Q.34q Social posit Q.34r Happiness is	Variables: Define Values [f (optional case	Paste Reset Cancel Help selection condition)			

...and click let to drag them across to the Numeric Variables box.

Count Occurrences of Values within Cases					
Larget Variable: Q.34j War is huma Q.34k Royal Wedt Q.34l Guns for poli Q.34m Ban Nuclea Q.34n YOP a wast	Target Label:	OK Paste Reset Cancel Help			
Q.35a Fiddling Soc Q.35b Fiddling fare Q.35c Fiddling tax Q.35c Fiddling tax Q.35d Buying stole	Define Values				

Now write **STATQUO** in the **Target Variable** box and **your own label** in the **Target Label** box.

Count Occurrences	s of Va	lues within Cases	
Iarget Variable: STATQUO Q.34j War is huma Q.34k Royal Wedt Q.35k Fiddling Soc Q.35c Fiddling tax Q.35d Buying stole		Target Label: Q.34 Agreement with items o.p.q.r Numeric Variables: Q.34o Shouldn't be Q.34p Contentmer Q.34q Social positi Q.34r Happiness is Define Values <u>I</u> f (optional case selection condition)	OK Paste Reset Cancel Help

Click on Define Values :

Count Values within Cases: Values to Count			×
Value Value System-missing System- or user-missing Range: through: Knough: Range, LOWEST through value:	Add Change Remove	Values t <u>o</u> Count:	
Range, value through HIGHEST:		Continue Cancel Help	

The dialog is already set for entry of values so type 3 in the Value box

Count Values within Cases: Values to Count			×
Value ● Value: 3 ● System-missing ● System- or user-missing ● Range: through: Prough: Compared through value:	Add Change Remove	Values t <u>o</u> Count:	
Range, value through HIGHEST:		Continue Cancel Help]

...and click on Add to transfer it to the Values to Count box:

Count Values within Cases: Values to Count			\mathbf{X}
Value ● Value: ● System-missing ● System- or user-missing ● Range: ● Interview ● Interview ● Range, LOWEST through value:	Add Change Remove	Values t <u>o</u> Count:	
Range, value through HIGHEST:		Continue Ca	ncel Help

Now do the same with the value 4

Count Values within Cases: Values to Count		X
Value Value: 4 System-missing System- or user-missing Range: Ihrough:	Add Change Remove	Values to Count:
Range, LOWEST through value: Range, value through HIGHEST:		Continue Cancel Help

Count Values within Cases: Values to Count		X
Value ● ⊻alue: ● System-missing ● System- or user-missing ● Range: ↓hrough:	<u>A</u> dd <u>C</u> hange <u>R</u> emove	Values to Count: 3 14
Range, LOWEST through value: Range, value through HIGHEST:		Continue Cancel Help

..and click Continue

Count Occurrences of Values within Cases					
Iarget Variable: STATQUO □ Q.34j War is huma □ Q.34k Royal Wedd □ Q.35k Fiddling Soc □ Q.35c Fiddling tax □ Q.35d Buying stole	•	Target Label: Q.34 Agreement count Numeric ⊻ariables: Q.34o Shouldn't be Q.34p Contentmer Q.34q Social positi Q.34r Happiness is Define Values [f] (optional case selection condition	OK <u>P</u> aste <u>R</u> eset Cancel Help		

Bit of a surprise, eh? I expected to be taken back to the Data Editor. If you click Define Values again, you'll see your selection is still there, but it still gave me a bit of a fright. Now Click OK

🔛 *fift	😫 *fifth form.sav [DataSet2] - SPSS Data Editor							
<u>File E</u> dit	<u>File Edit Yiew D</u> ata Iransform Analyze Graphs <u>U</u> tilities <u>Wi</u> ndow <u>H</u> elp							
🗁	😕 🛛 🖨 🖝 🔶 🐜 🖗 🌾 🏥 🏚 購 💱 🔕 🌑							
	Name	Туре	Width	Deci	Label	Values	Missing	^
138	3 v275	Numeric	2	0	Q.34o Shouldn't be conspicuous	{1, Strongly disagree}.	-1,23,24	
139) v276	Numeric	2	0	Q.34p Contentment brings better life	{1, Strongly disagree}.	-1,23,24	-
140) v277	Numeric	2	0	Q.34q Social positions fixed	{1, Strongly disagree}.	-1,23,24	
141	v278	Numeric	2	0	Q.34r Happiness is satisfaction	{1, Strongly disagree}.	-1,23,24	~
Data View Variable View								
SPSS Processor is ready								

Another surprise! I thought it would have gone straight to the location of the new variable. What's going on? Don't worry, your new variable **STATQUO** has been created and is appended in the last row of the **Data Editor**. Scroll down to see it:

🖬 *fifth_form[1].sav [DataSet1] - SPSS Data Editor													
Eile Edit Yiew Data Iransform Analyze Graphs Utilities <u>W</u> indow <u>H</u> elp													
😕 🖬 🖻 🚸 🟕 🗽 🖗 /推 🏥 🏨 購 😵 🔕 🌢													
	Name	Туре	Wi	Deci	Label	Values	Missing	T 🔷					
229	v429	Numeric	2	0		{0, None}	-1,23,24	1					
230	v430	Numeric	2	0		{0, None}	-1,23,24	1					
231	STATQUO	Numeric	8	2	Q.34 Agreement with items o,p,q,r	None	None						
232								~					
Data View Variable View						>							
					SPSS Processor is ready			SPSS Processor is ready					

..and then look at the syntax generated (automatically pasted to the Viewer window):

```
COUNT

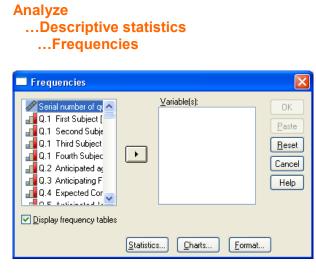
STATQUO = v275 v276 v277 v278 (3) v275 v276 v277 v278 (4) .

VARIABLE LABELS STATQUO 'Q.34 Agreement with items o,p,q,r' .

EXECUTE .
```

You'll have to change the print format manually by changing 2 to 0 in the Decimals column

To get the same tables as before:



Press [CTRL] + [END] to skip to the end of the list:

Frequencies			
	•	Variable(s):	OK Paste <u>R</u> eset Cancel Help
	<u>S</u> tatistic	s <u>C</u> harts <u>F</u> orma	at

Highlight **STATQUO** and click **b** to transfer it to the **Variables** box:

Frequencies			X			
<pre>[v424] [v425] [v426] [v427] [v428] [v429] [v430]</pre>	•	<u>Variable(s):</u>	OK Paste Reset Cancel Help			
☑ <u>D</u> isplay frequency tables						
	<u>S</u> tatistic:	s <u>C</u> harts <u>F</u> ormal				

Click OK to get the tables.

...but it's so much quicker and easier in syntax!

Next tutorial: <u>3.5.2.4 The COMPUTE command 1 - Attachment to status quo</u>

Feedback on ease of understanding and use of tutorial, please, to: johnfhall@orange.fr