

## Chapter 6

### Control Cards for Affective Subtests

#### Contents

List of Control Cards for Affective Subtests: .....	2
Example sets. ....	5
Set 1: .....	5
Set 2: .....	5
Set 3: .....	6
Set 4: .....	6
Set 5: .....	6
Set 6: .....	7
Set 7: .....	7
More about the *pol card.....	8
Peeking at Sub worksheets .....	9
The *tst card .....	9

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In this chapter we discuss the various Lertap control “cards” used for processing results from affective tests and/or surveys. The term affective refers to an instrument which is meant to measure attitudes and opinions. For Lertap to work effectively, the items (or questions) used by the instrument must use fixed-choice responses. Here are some sample affective items:

(7) The city of Perth is:

cold      1    2    3    4    5    6    7    hot

(31) I will recommend to others that they use LERTAP.

- 1) strongly disagree
- 2) disagree
- 3) undecided
- 4) agree
- 5) strongly agree

Additional comments on Lertap 5 control cards of a more introductory nature may be found in Chapter 4.

## List of Control Cards for Affective Subtests:

Here is an overview of the control cards which are used for processing results from affective subtests:

<b>Card</b>	<b>Required?</b>	<b>Comments (affective subtests)</b>
*col	<u>yes</u>	This card does several things; above all, it tells Lertap how many items there are in the subtest, and the columns where these items are found in the Data worksheet.
*sub	<u>yes</u>	This card is required of affective subtests, and must have the "Aff" control word. Otherwise Lertap will assume a cognitive subtest. This card is also used to give the subtest a name, and a title. If the subtest's items do not use 1 2 3 4 5 as their responses, then this card must carry an Res=(...) specification.
*alt	no	Used when the items do not all have the same number of options. If all items use the same number of options, this card is not required.
*pol	no	If the "best" answer to an affective item is not always the first answer, or is not always the last answer, this card is used to indicate where the best answer is. Use a + sign if the best answer is last; use a - sign otherwise
*mws	no	This card is not used as much as it is for cognitive subtests; it's used to specify unique response weights.

More detailed comments about these cards, with some examples:

*col	<p>The definition of every subtest <b>must</b> begin with a *col card. This card tells Lertap where the item responses are in the Data worksheet. It does this by using a format exemplified in these sample *col cards:</p> <p>*col (c3-c12) *col (c5, c7, c9, c11-c20)</p> <p>Here the first example says that item responses start in column 3 and end in column 12. The second example says pick up the first item response from column 5, the second from column 7, the third from column 9, and the rest starting in column 11 and ending in column 20.</p>												
*sub	<p>Affective subtests <b>must</b> make use of the *sub control card. There are several control words which may be used on this card, and one of them, "aff", has to be present in order for Lertap to know that the subtest is an affective one. Here's a list of the control words which may be used on the *sub card:</p> <table border="1" data-bbox="344 819 1369 2007"> <tr> <td data-bbox="344 819 517 898">Aff</td> <td data-bbox="517 819 1369 898">Means "affective". This control word <b>must</b> be present.</td> </tr> <tr> <td data-bbox="344 898 517 1111">MDO</td> <td data-bbox="517 898 1369 1111">Means "missing data assignment off". When this control word is present, Lertap's default missing data weights are turned off. If for example Res=(1,2,3,4,5), a weight of 3, the centre of the weights, is ordinarily assigned to missing data. If MDO is present this automatic assignment is extinguished, and missing data will receive a weight of zero.</td> </tr> <tr> <td data-bbox="344 1111 517 1256">Name=()</td> <td data-bbox="517 1111 1369 1256">Allows a name to be given to the subtest. The name may be of any length, and may contain any characters except an opening or closing parenthesis. Lertap's subtest name is equivalent to SPSS' variable label. Optional.</td> </tr> <tr> <td data-bbox="344 1256 517 1368">PER</td> <td data-bbox="517 1256 1369 1368">Means "percentage" scoring. Original subtest scores will be reported for each test taker, along with a percentage-of-maximum-possible score. Optional.</td> </tr> <tr> <td data-bbox="344 1368 517 1839">Res=()</td> <td data-bbox="517 1368 1369 1839"> <p>This is an important control word. It tells Lertap both the number and nature of response codes used by the items of the subtest. Examples:</p> <p>Res=(1,2,3,4,5) Res=(A,B,C,D,E) Res=(1,2,3,4,5,6,7) Res=(u,v,w,x,y,z)</p> <p>If the items of your subtest use res=(1,2,3,4,5), you don't have to have an res=() declaration on the *sub card—this response code set is the default for affective items. The maximum number of response codes which may be used is 10.</p> </td> </tr> <tr> <td data-bbox="344 1839 517 2007">SCALE</td> <td data-bbox="517 1839 1369 2007">Means "scaled" score. Original scores will be reported for each test taker, along with a scaled score equal to the original score divided by the number of items in the subtest. Such a score is sometimes known as a "normalised" score. Optional.</td> </tr> </table>	Aff	Means "affective". This control word <b>must</b> be present.	MDO	Means "missing data assignment off". When this control word is present, Lertap's default missing data weights are turned off. If for example Res=(1,2,3,4,5), a weight of 3, the centre of the weights, is ordinarily assigned to missing data. If MDO is present this automatic assignment is extinguished, and missing data will receive a weight of zero.	Name=()	Allows a name to be given to the subtest. The name may be of any length, and may contain any characters except an opening or closing parenthesis. Lertap's subtest name is equivalent to SPSS' variable label. Optional.	PER	Means "percentage" scoring. Original subtest scores will be reported for each test taker, along with a percentage-of-maximum-possible score. Optional.	Res=()	<p>This is an important control word. It tells Lertap both the number and nature of response codes used by the items of the subtest. Examples:</p> <p>Res=(1,2,3,4,5) Res=(A,B,C,D,E) Res=(1,2,3,4,5,6,7) Res=(u,v,w,x,y,z)</p> <p>If the items of your subtest use res=(1,2,3,4,5), you don't have to have an res=() declaration on the *sub card—this response code set is the default for affective items. The maximum number of response codes which may be used is 10.</p>	SCALE	Means "scaled" score. Original scores will be reported for each test taker, along with a scaled score equal to the original score divided by the number of items in the subtest. Such a score is sometimes known as a "normalised" score. Optional.
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	Title=()	Gives a short name, or title, to the subtest. There may be up to 8 characters between the parentheses. Whilst any characters may be used, it is suggested that only letters and digits be employed. For compatibility with SPSS, the title should begin with a letter, and should not contain a space or full stop (period). Lertap's subtest title is the same as SPSS' variable name. Optional.
	Wt=	Assigns a compositing weight to the subtest. By default, Lertap assigns Wt=1 for all subtests. If there is more than one subtest with Wt=1, Lertap forms a Total test score by adding together all subtest scores. To exclude a subtest from the Total, use Wt=0 (zero).
<p><u>Examples:</u></p> <p>*sub aff, res=(1,2,3,4,5,6,7), name=(Perth Q1), title=(Perth1)          *sub aff, mdo, title=(Ed503), name=(Ed 503 feedback), wt=0</p> <p>Here the second example does not have an res=() declaration, and Lertap will use its default assignment for affective subtests, which is res=(1,2,3,4,5).</p>		
*alt	<p>This control card is used when not all items use all of the response codes found in a subtest's res=() declaration. For example, if res=(1,2,3,4,5,6,7), and the following card is used</p> <p>*alt 55555 77777</p> <p>then Lertap will know that the first five items of the subtest use only the first 5 response codes, while the last five items use all 7. Optional.</p>	
*pol	<p>This control card is used to tell Lertap to reverse the scoring for some of the subtest's items. By default, an affective item is weighted in a forward manner, with the first response getting a weight of 1 point, the second a weight of 2 points, the third a weight of 3 points, and so on. To reverse this pattern, that is, to give the highest weight to the first response, and the lowest weight to the last response, use a *pol card with + and - signs.</p> <p>*pol +-++- -+-+</p> <p>This card reverses the weights for every other item. The *pol card is optional—it's required only when one or more items are to have their weights reversed.</p>	
*mws	<p>The "multiple-weights specification" card is used to change the response weights for a designated item. For example, if a subtest is using response weights of res=(1,2,3,4,5), and the following *mws card is used</p> <p>*mws c3, 5, 4, 3, 2, 1</p> <p>then the weights for the item whose responses are found in column 3 of the Data worksheet will be 5 for the first response, 4 for the second response, 3 for the third response, 2 for the fourth response, and 1 for the last (fifth) response. This would be the same as reversing the item's weights on a *pol card. If only a few items in a subtest are to have their</p>	

	<p>weights reversed, then using *mws cards, one for each item, is sometimes easier than using a *pol card.</p> <p>The weights found on the *mws card do not have to be integers:</p> <p>*mws c17, 0.00, 0.25, 0.50, 0.75, 1.00</p> <p>this card applies to the item whose responses are found in column 17 of the Data worksheet. For this item, the first response is to have a weight of 0.00, the second a weight of 0.25, the third a weight of 0.50, and so forth.</p> <p>*mws Call, -3, -2, -1, 0, 1, 2, 3</p> <p>this card's "Call" means all columns, that is, all items which belong to the respective subtest. There are seven (7) weights shown in this *mws specification—the Call word means that all items belonging to the subtest will use these weights.</p> <p>There are many countries which use a decimal separator different to the full stop (or period). Users in these countries are required to express decimal values as shown here, with the full stop, but Lertap will convert them correctly.</p>
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## Example sets

Here are some examples of sets of control cards for affective subtests.

### Set 1:

```
*col (c28-c37)
*sub Aff, Name=(Comfort with using LERTAP2), Title=(Comfort)
```

There are 10 affective items in this subtest. As the \*sub card does not carry an res=( ) declaration, Lertap will assign res=(1,2,3,4,5), the default for affective subtests. Since there is no \*alt card, all 10 items will be assumed to use all five response codes. And, since there is no \*pol card, the items will all be forward weighted, that is, a response of "1", the first response in the res=( ) list, will get a weight of 1 point; the second response, "2", will get 2 points, ..., the last response, "5", will get 5 points.

What would be the minimum possible score on this 10-item subtest? Ten. The minimum possible "score" for each item is one; on the other hand, the maximum possible score on an *item* is 5, so the maximum possible *subtest* score is 50. If a person does not answer an item, a score of 3 points will apply since the missing data option has not been turned off (there is no MDO control word seen on the \*sub card). If MDO had been used, then the minimum possible *item* "score" would be zero—in turn, this would make the minimum possible *subtest* score zero as well.

### Set 2:

```
*col (c28-c37)
*sub Aff, Title=(Comfort), Name=(User satisfaction), Wt=0
*pol +----- +-----
```

This example adds a \*pol card. There's still no explicit res=( ) declaration on the \*sub card, so res=(1,2,3,4,5) will be applied by default. Six of the 10 items are to be reverse scored—the \*pol card directs Lertap to reverse the scoring for the

second, third, fourth, fifth, eighth, and ninth items. For these items, a response of "1", the first response code found in the res=() declaration, will get a score of 5 points; the second response, "2", will get a score, or weight, of 4 points, and so on, down to the last possible response, "5", which will have a weight, or score, of just 1 (one) point. (There's a bit more about using \*pol cards later.)

In this example a Wt= assignment appears on the \*sub card, which will mean that scores from this subtest will not be added to those from other subtests to make a Total score. What other subtests, you might well ask? We can't tell—we'd have to assume that the three cards shown above were not the only cards in the CCs worksheet. If there's only one subtest, a Wt= assignment doesn't make sense, and will be ignored by Lertap.

### Set 3:

```
*col (c28-c37)
*sub Aff, Title=(Comfort), Name=(User satisfaction), Wt=0
*mws c29, 5, 4, 3, 2, 1
*mws c30, 5, 4, 3, 2, 1
*mws c31, 5, 4, 3, 2, 1
*mws c32, 5, 4, 3, 2, 1
*mws c35, 5, 4, 3, 2, 1
*mws c36, 5, 4, 3, 2, 1
```

This example amounts to the same thing as the previous example. Now (for some reason), \*mws cards have been used to reverse the scoring for six items.

### Set 4:

```
*col (c28-c37)
*sub Aff, Title=(Comfort), Name=(User satisfaction), Wt=0
*pol +---- +----+
*mws c32, 1, 2, 3, 4, 5
```

In this example the \*pol card reverses the item scoring for six items, including the item whose responses are found in column 32 of the Data worksheet. However, the \*mws card gets Lertap to change the weights for the item whose responses are in column 32, and effectively re-weights this item in the standard forward manner. When used, \*mws cards override whatever has come before.

### Set 5:

```
*col (c28-c37)
*sub Aff, Res=(1,2,3,4,5,6,7), T=(Comfort), N=(User satisfaction)
*alt 55555 77777
*pol +---- +----+
```

It's a bit unusual to see a \*alt card used with affective subtests, but we've got one here, to be sure. It says that the first five items uses the first 5 responses seen in the res=() declaration, while the last five use all 7 response codes. What's the minimum possible score on this 10-item subtest? Ten. There are 10 items, and, since there's no MDO word on the \*sub card, the minimum possible item score is 1 (one) for all 10 items.

What's the maximum possible subtest score? Sixty (60). There are five items whose maximum possible score is 5 points each, and there are another 5 items with a maximum possible score of 7. Five times 5, plus five times 7, gives 60.

Chapter 4 mentioned that the control words used on the \*sub card, such as Name and Title, could be dramatically abbreviated, if wanted. The person who typed up these control cards took advantage of this possibility.

### Set 6:

```
*col (c28-c37)
*sub Aff, Res=(1,2,3,4,5,6,7), T=(Comfort), N=(User satisfaction)
*mws Call, -3, -2, -1, 0, 1, 2, 3
```

The "Call" statement on this example's \*mws card says that all items in the subtest are to have their scoring changed so that a response of "1" gets -3 points, "2" gets -2 points, "3" gets -1 point, "4" gets zero points, "5" gets 1 point, "6" gets 2 points, and "7" gets 3 points. (There are a few affective instruments which score responses in this manner.)

### Set 7:

```
Lertap syntax, 21 July 2543.
Part1
*col (c4 - c23)
*sub aff, name=(CAQ 5.22, Part 1), title=(Part1)
*pol +-+++ +++++ +----- ----+
Part2
*col (c24 - c38)
*sub aff, name=(CAQ 5.22, Part 2), title=(Part2)
Part3
*col (c39 - c48)
*sub aff, name=(CAQ 5.22, Part 3), title=(Part3)
Part4
*col (c49 - c61)
*sub aff, name=(CAQ 5.22, Part 4), title=(Part4)
Part6
*col (c80 - c90)
*sub aff, name=(CAQ 5.22, Part 6), title=(Part6)
Part7
*col (c91 - c100)
*sub aff, name=(CAQ 5.22, Part 7), title=(Part7)
*pol +-+++ -----+
```

The cards above are from a research project which Dr Nanta Palitawanont of Burapha University, Thailand, conducted in July of 2543 (year 2000 in the Gregorian calendar). She was using version 5.22 of the Computer Attitude Questionnaire from the University of North Texas to collect information from students and staff. Above you can see how Dr Palitawanont defined various subtest, or Part, scores, with some of the Parts having items which had to be reverse scored.

In this example there are some lines which do not begin with an asterisk (do not have a \* at the beginning). Such lines are ignored by Lertap—they provide the chance to add comments to the CCs worksheet. Take some care, however: a line which is totally blank is interpreted by Lertap as the last line to be processed—if there are more lines in the CCs sheet after the blank line, they will not be read even if they have the magic asterisk as their first character.

Chapter 4 has another example of a job which involved processing multiple affective subtests.

## More about the \*pol card

This small section is provided for those readers who might want more clues about the use of the \*pol card.

Consider these three items, taken from the Lertap Quiz data set (Nelson, 1974):

(28) I have used item analysis programs superior to LERTAP.

- 1) strongly disagree
- 2) disagree
- 3) have not used such programs before
- 4) agree
- 5) strongly agree

(31) I will recommend to others that they use LERTAP.

- 1) strongly disagree
- 2) disagree
- 3) undecided
- 4) agree
- 5) strongly agree

(32) I don't think I could design my own LERTAP analysis.

- 1) strongly disagree
- 2) disagree
- 3) undecided
- 4) agree
- 5) strongly agree

These three items are affective ones. They all use the same response codes, which is the set {12345}. They do not have a right answer, but they might be said to have a "best" answer, that is, an answer which reflects the most positive response to the statement posed. For Item 28 the "best" answer is the first, for Item 31 it's the last, while for Item 32 it's the first.

If we wanted to add the responses to these items together so as to indicate whether or not people had a positive outlook to their Lertap experience, we'd want to first reverse the scoring of Items 28 and 32. On both of these items, the best response, the most positive response, is "strongly disagree".

If we did this, then someone with a total score of 15 over these three items will have answered "strongly disagree" to Item 28, "strongly agree" to Item 31, and "strongly disagree" to Item 32.

In Lertap, the way to accomplish this sort of scoring, wherein some items are reverse scored, is via the \*pol card. \*pol -+- is what would do the job in this three-item example.

What did people do before they had Lertap and its \*pol card? Some of them used to reverse items as they were entered into the data set. If someone answered "1" on Item 28, a "5" would be entered in the data set. Others, SPSS users, would create a new variable using a statement similar to this:

Item28R = 6 - Item28



As you have now seen, the \*pol makes these shenanigans unnecessary.

### **Peeking at Sub worksheets**

If you're not sure how Lertap will interpret your control cards, use the Run option on the toolbar to "Interpret CCs lines", and then look at the subtest's Sub worksheet.

Sub worksheets are normally hidden from view. To unhide them, use Excel's Format / Sheet option. Sub sheets are not spectacularly formatted, but you will probably be able to understand most of their contents.

### **The \*tst card**

There is another card which may be used with any subtest, including affective ones. The \*tst card is used to break out certain data records from the Data worksheet, after which Lertap's Run options are used to get results for these records only.

For example,

```
*tst c12=(1,2), c13=(F)
```

will have Lertap make a new Excel workbook containing only those cases in the Data worksheet which have a 1 or a 2 in column 12, and an F in column 13. Once this workbook is created, all options on Lertap's toolbar are available for use, including, of course, the Run options.

There is more information on the use of the \*tst card in Chapter 4.