ANALYSIS OF DATA SET 3

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The first point to consider for this data set is the nature of the information about the response pattern of the skin conductance variable with time. Since for many of the observations (81/144) the onset value is also the peak value it is clear that there must be a general tendency for skin conductance to decline. Do the cases with peak > onset arise from a gradual increase or from a secondary mode after an initial decline? Do other cases have a secondary peak below the onset value? For a proper understanding and analysis of the effects of predictability and control of anxiety it would be necessary to have more information about the skin conductance response pattern, the onset and peak statistics being clearly not sufficient.

Given the presented data the dominant feature is the high proportion of zero differences for (peak − onset). The rather variable set of non-zero values is only to be expected for such a variable, given the effective censoring at zero for most of the values. Effectively we are looking at only half a distribution and tests for outliers will be most unreliable. The initial stage of the analysis is the tabulation of difference and peak values (Table 1).

The 24 subjects' response patterns of skin conductances over short term time periods and between successive time periods can be summarised in several ways. The most striking aspect of the data is the distribution of zero values for (peak − onset). In each group the number of zero values increases through the six time periods:

3, 6, 6, 9, 10, 9   for Group 1

2, 5, 9, 7, 7, 9   for Group 2.

TABLE 1

	Differences (Peak – Onset)						Peak Values					
	t_1	t_2	t_3	t_4	t_5	t_6	t_1	t_2	t_3	t_4	t_5	t_6
Group 1												
1)	1.8	1.4	1.3	1.3	0.8	0.6	15.4	13.7	13.6	12.9	12.5	12.0
2)	0	0	0	0	0	0	16.6	16.0	15.8	15.1	14.4	14.1
3)	14.1	0	2.4	0	0	0	47.8	34.8	35.8	40.3	34.0	36.1
4)	0	0.7	0.7	0.9	0	1.6	14.0	15.0	13.7	12.7	11.8	13.1
5)	0.2	0.1	0.2	0	0	0	6.5	6.6	6.4	6.5	6.3	6.2
6)	1.8	0	1.6	0	0	0	28.0	27.4	29.4	28.7	29.5	31.1
7)	0	0	0	0	0	0	27.5	28.7	28.9	28.4	28.3	27.2
8)	0.3	0	0	0	0	0	4.0	4.5	3.9	4.0	2.9	2.4
9)	2.6	0.5	0	0	0	0.2	12.6	11.3	10.1	9.3	8.6	8.4
10)	0.9	0.3	0	0	0	0	7.0	6.3	5.9	5.4	4.7	4.4
11)	0.7	0	0	0	0	0	10.3	9.2	9.1	8.8	8.4	8.1
12)	0.5	0.3	1.2	0.9	0.3	0	3.2	3.9	6.5	6.9	5.7	4.9
Group 2												
13)	8.9	6.0	0	3.6	0	0	20.6	22.5	14.5	15.1	20.4	14.4
14)	0	0	0	0	0	0	32.1	32.4	31.7	33.0	33.4	33.6
15)	1.0	0	0	0	0.6	0	21.0	20.4	20.4	20.6	23.6	20.8
16)	0.1	0	0	0	0	0	4.2	4.1	4.8	3.8	3.6	3.5
17)	1.8	1.1	0.2	0	0	0	7.8	6.6	5.1	4.6	4.1	3.4
18)	0.6	0.7	0	0	0.6	0.4	10.1	9.9	9.0	8.5	8.9	8.6
19)	0	0	0	0	0	0	2.1	1.9	1.8	1.7	1.6	1.6
20)	1.0	3.2	1.8	1.9	2.0	3.3	22.9	24.6	23.7	24.0	23.8	24.3
21)	3.0	1.9	0	0.2	0	0	8.0	8.3	5.5	5.7	6.0	5.3
22)	1.5	3.3	1.9	2.5	1.8	1.0	9.1	12.0	11.2	11.9	11.6	11.2
23)	5.3	0	0	0	0.5	0	29.6	25.0	22.9	20.7	19.8	18.5
24)	0.7	0.5	0	0.3	0	0	7.6	8.4	7.3	7.4	7.4	7.1

TABLE 2

	(PEAK – ONSET)			PEAK	
	Total Number Non-zeros	Non-zeros after t_1	Non-zeros after t_2	Mean	Linear Trend
Group 1					
2)	0	0	0	15.3	−0.5
7)	0	0	0	28.2	−0.1
8)	1	0	0	3.6	−0.4
11)	1	0	0	9.0	−0.4
3)	2	1	1	38.1	−1.6
6)	2	1	1	29.1	+0.6
10)	2	1	0	5.7	−0.6
5)	3	2	1	6.4	−0.1
9)	3	2	1	10.0	−0.8
4)	4	4	3	13.4	−0.4
12)	5	4	3	5.2	+0.4
1)	6	5	4	13.4	−0.6
Group 2					
14)	0	0	0	32.7	+0.3
19)	0	0	0	1.8	−0.1
16)	1	0	0	3.9	−0.2
15)	2	1	1	20.8	+0.1
23)	2	1	1	22.8	−2.1
13)	3	2	1	17.9	−1.0
17)	3	2	1	5.3	−0.9
21)	3	2	1	6.5	−0.6
24)	3	2	1	7.5	−0.2
18)	4	3	2	9.2	−0.3
20)	6	5	4	23.9	+0.2
22)	6	5	4	11.2	+0.3

Note that the large proportion of zeros, and their uneven distribution between subjects will tend to produce the appearance of large, fairly consistent, autocorrelations. The distribution of numbers of zero values between subjects is similar for the two groups:

0, 0, 1, 1, 2, 2, 2, 3, 3, 4, 5, 6   for Group 1

0, 0, 1, 2, 2, 3, 3, 3, 3, 4, 6, 6   for Group 2.

There seem to be three subsets of subjects in each group;

two subjects with all zero values

three subjects with mainly or all non-zero values

seven subjects with a few non-zero values .

The last subset have their non-zero values predominantly in the earlier periods and the pattern of zero values appears very similar for the two groups.

The patterns in the peak values appear to be unrelated to the patterns of (peak − onset) with wide variation of mean values and reasonably consistent negative trends. The informative statistics are tabulated in Table 2. They show, I believe, that there is clear acclimatisation over exposures, both of peak values (linear trend) and of non-zero (peak − onset) values. Although in the presentation at the workshop I suggested there might be a difference between the groups in respect of (peak − onset) values in the later exposures, I think that was wishful thinking. I believe that the similarities between the groups are strong in all respects (perhaps surprisingly strong) and there are no differences between the groups.

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