Chapter 7
Several Measures of Reliability

Answers to Extra Problems

7.1 Write a research question that can be answered from the data using a paired sample t test. Run the t test and provide a full interpretation.

```
GET
  FILE='X:\Morgan Documents\SPSS-5th Edition Introductory\Data
Sets\college student data.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
T-TEST PAIRS=height WITH pheight (PAIRED)
  /CRITERIA=CI(.9500)
  /MISSING=ANALYSIS.
```

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student height in inches	67.3000	50	3.93959	.55714
	same sex parent's height	66.7800	50	5.10418	.72184

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	student height in inches & same sex parent's height	50	.842	.000

With the paired t being .52 mean difference. With a t = 1.3, p=.142.

There is a significant and large correlation between the estimates of height and same sex parent height r=.842, p<.001. Although there is a strong correlation between these data, there is not a statistical difference between the estimated height of students and same sex parent height with the paired t = 1.3, p-.142.

7.2 Identify four variables that could be combined to make a summated scale. Check the Cronbach's alpha for that scale. Write an interpretation of the resulting output.

```
RELIABILITY
  /VARIABLES=evalinst evalprog evalphys evalsocl
  /SCALE('Alpha for Univ Evaluation Scale') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE CORR
  /SUMMARY=TOTAL.
```

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.506	.533	4

Item Statistics

	Mean	Std. Deviation	N
positive evaluation, institution	3.39	.953	49
positive evaluation, major	3.27	.953	49
positive evaluation, facilities	2.76	1.071	49
positive eval, social life	3.08	1.187	49

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
positive evaluation, institution	9.10	3.719	.658	.662	.103
positive evaluation, major	9.22	3.928	.586	.608	.176
positive evaluation, facilities	9.73	7.032	-.199	.047	.812

positive eval, social life	9.41	3.788	.400	.353	.327

Inter-Item Correlation Matrix

	positive evaluation, institution	positive evaluation, major	positive evaluation, facilities	positive eval, social life
positive evaluation, institution	1.000	.779	-.150	.579
positive evaluation, major	.779	1.000	-.139	.478
positive evaluation, facilities	-.150	-.139	1.000	-.213
positive eval, social life	.579	.478	-.213	1.000

I chose these four items because they all have to do with evaluating life as a student. IT is clear though that they do not fit together as a construct. The alpha is just above .5 and would not be acceptable as a construct. However, note the negative correlation of facilities with the other items in the correlation Inter –Item Correlation Matrix. Also note the last column of the Item Total Statistics. Not that if the evaluation of facilities was removed, the alpha would be higher.

I have run it here, without facilities.

```
RELIABILITY
  /VARIABLES=evalinst evalprog evalsocl
  /SCALE('Alpha for Univ Evaluation Scale') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE CORR
  /SUMMARY=TOTAL.
```

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.812	.825	3

Sample write-up

The Cronbach's alpha was run on the overall evaluation of students on four items Evaluation of the institution, program, social life, and facilities. Alpha was .50. Facilities was negatively correlated with the other three and was removed. The overall alpha of the remaining three was .812 and the items fold together into one construct.