

Part 1: Answers - Reliability (Stability)

Create the data file below (handstand balance skill). To get two scores per person you record the number of seconds each person holds their handstand on each of two attempts.

Time 1	Time 2
6	8
12	11
28	20
3	5
7	7
15	14

Obtain a measure of stability

Cronbach's Alpha	N of Items
0.935	2

Interpretation: since alpha (.94) very strong, data is considered reliable based on the stability of the scores from time 1 to time 2.

Obtain SEM (remember to use the SD of the average balance time)

avghstandscore		
N	Valid	6
	Missing	0
Std. Deviation	7.23648	

$$SEM = 7.23648\sqrt{1 - .935} = 1.84$$

Interpretation: Measurement error very small since SEM small relative to the Sx.

Part 2: Answers - Reliability (Internal Consistency)

Consider now a written multiple choice format test administered once. To get 2 scores per person you could record how many of the even numbered and odd numbered items each person answered correctly.

Obtained a measure of internal consistency for split halves:

Cronbach's Alpha	N of Items
0.502	2

Did spearman brown (by hand)

$$R_{sb} = \frac{2(.502)}{1 + [(2 - 1)(.502)]} = .67$$

Interpretation: Reliability (.67) not quite at the optimal value of .70. So, you could say test scores have reasonably good internal consistency.

Obtained SEM

total score		
N	Valid	6
	Missing	0
Std. Deviation	8.98332	

$$SEM = 8.98332\sqrt{1 - .6684} = 5.17$$

Interpretation: Significant amount of measurement error since SEM not very small relative to S_x .

Part 3: Answers - Reliability (Stability)

Use the Cereals file

Obtain an estimate of the reliability of the rating data

Get alpha

Cronbach's Alpha	N of Items
0.995	2

Interpretation: Ratings quite stable (Alpha = .995); thus reliability of the rating data excellent.

Obtained SEM

avgrating		
N	Valid	77
	Missing	0
Std. Deviation		13.95396

$$SEM = 13.95396\sqrt{1 - .995} = .99$$

Interpretation: Very little measurement error since the SEM very small relative to the Sx.

Part 4: Answers - Objectivity

Assume you had 3 judges scoring students in a diving class. From these three scores per person assess objectivity by examining the consistency across the 3 sets of scores using coefficient alpha.

Judge1	Judge2	Judge 3
18	19	17
12	15	13
7	10	8
10	9	9
12	10	10
15	14	13

Obtained alpha

Cronbach's Alpha	N of Items
0.967	3

Interpretation: Judges scores have very good objectivity since alpha (.97) very high. This means the 3 judges very consistent in their scoring of dives.

Obtained SEM

avgscore		
N	Valid	6
	Missing	0
Std. Deviation		3.56786

$$SEM = 3.56786\sqrt{1 - .967} = .65$$

Interpretation: Very little measurement error since SEM small relative to Sx.