Reliability

LLE – Mathematics and Statistics Skills

1. A blood pressure machine is used to record patients' systolic blood pressure. A few minutes later a second reading is taken by the same machine. The results for 12 patients are shown

Patient	1	2	3	4	5	6	7	8	9	10	11	12
Reading 1	118	125	131	122	144	110	112	135	116	122	125	132
Reading 2	137	148	148	139	161	129	125	151	130	136	146	154

   a Does the table suggest that this machine is working correctly?

   b An intraclass correlation coefficient (ICC) is calculated to check test-retest absolute agreement. The coefficient value is 0.395. How would you interpret this value?

   ○ Poor   ○ Acceptable   ○ Good   ○ Very good

   c A second machine is used and found to have an ICC = 0.993 for test-retest. Compare this machine to the first.

2. Trained health care workers assess the mobility of recovering road traffic accident patients using a new index. 5 healthcare workers all assess the same 25 patients using the scale. An intraclass correlation coefficient (ICC) is calculated to assess the inter-rater reliability of the scale and produces ICC = 0.76.

   (a) How would you rate the reliability of this index between different health care workers assessments?

   ○ Poor   ○ Acceptable   ○ Good   ○ Very good   ○ Excellent

3. To assess a patient's memory skills, the patient is graded on scale of 1 to 10 on 5 different assessments. From these 5 assessments a memory skill index is produced for the patient by summing the individual scores.

   (a) Name a coefficient that can be used to assess the internal consistency of the 5 assessments in measuring memory skill.

   (b) Given that the coefficient returns a value of 0.72, how would you assess the internal consistency of the 5 scales?

   (c) If the 4th assessment in the scale is removed from the index calculation, the coefficient becomes 0.85. What would you conclude about this assessment?