Problem solving

Selection

Calculation problems

Problem 1.

Rank the candidates according to their true performance, if interviews and tests are equally weighted.

Candidate	Interviewer	Interview score	Written test score
A	X	10	8
B	X	13	9
C	X	15	10
D	Y	8	7
E	Y	12	12
F	Y	9	11
mean(s)			
std. deviation(s)			

Solution:

To get the true ranking, first, you have to calculate the total standardised scores for each candidate, and second, you have to rank the individuals according to these scores.

To calculate the standardised interview score (standardised by the interviewer) for individual A:

1. Compute the group mean. Hence A was interviewed by X it is: (10+13+15)/3 = 12.67

2. Compute the group std. deviation:
$[(10-12.67)^2+(13-12.67)^2+(15-12.67)^2]^{0.5}/(3–1)^{0.5} = 12.67^{0.5}/2^{0.5}= 2.52$

3. (Actual – Group mean)/(Std. deviation in the group) = (10–12.67)/2.52 = -1.06

4. To calculate the standardised written test score, the method is the same but there are no subgroups.

The totalized standard score is the sum of the standardized interview and the standardised written test score.

Problem 2.

Rank the candidates according to their true performance, if:

a) the selection measures are equally weighted.

b) the weight of the interview is 3 and of the written test is 2.

Candidate	Interviewer	Interview score	Written test score
A	X	11	13
B	X	13	9
C	X	15	10
D	X	18	17
mean(s)			
std. deviation(s)			

a) Solution:

Interview mean: (11+13+15+18)/4=14.25

Interview SD: $((11.00-14.25)^2+(13-14.25)^2+(15-14.25)^2+(18-14.25^2)^{0.5}/(4-1)^{0.5}=$

$(10.5625 + 1.5625 + 0.5625 + 14.0625)^{0.5}/(3)^{0.5} = 5.1720 / 1.7321 = 2.9861$

Written mean: (13+9+10+17)/4=12.25

Written SD: 3.5940

Candidate A:

Std. interview score: (A-M)/SD=(11 – 14.25) / 2.9861 = -1.0884

Std. written score: (13 – 12.25) / 3.5940 = +0.2087

Total std. score: -1.0884+0.2087 = -0.8797

Candidate B:

Std. interview score: -0.4186

Std. written score: -0.9043

Total std. score: -1.3229

Candidate C:

Std. interview score: 0.2512

Std. written score: -0.6260

Total std. score: -0.3749

Candidate D:

Std. interview score: 1.2558

Std. written score: 1.3217

Total std. score: 2.5775

Rank order: D, C, A, B

b) Solution:

Means, standard deviations, standardised interview scores and standardised written test scores remain the same as in the a) part. The only difference is that these standardised scores are weighted when calculating the total standardised scores.

Candidate A:
Total std. score: (3/5)(-1.0884) + (2/5)(0.2087) = -0,56956

Candidate B:
Total std. score: -0,61288

Candidate C:
Total std. score: -0,09972

Candidate D:
Total std. score: 1,282159

Rank order: D, C, A, B

Problem 3.

Rank the candidates according to their combined performance. Use the appropriate method.

a) Weights are 50-50%

b) Weights are 80-20%

Candidate	IQ test (0-150)	Job interview (1-5)	Rank
A	100	3	
B	110	4	
C	81	5	
mean(s)			
std. deviation(s)			

Solution a):

$Mean_{IQ} = (100+110+81)/3 = 291/3 = 97$

$Mean_{JI} = (3+4+5)/3 = 4$

$Std.Dev._{IQ} = [(100-97)^2+(110-97)^2+(81-97)^2]^{0.5} / 2^{0.5} = 14.73$

$Std.\ Dev._{JI} = [(3-4)^2+(4-4)^2+(4-5)^2]^{0.5} / 2^{0.5} = 1$

A = (100-97)/14.73 + (3-4)/1 = -0.796 = -0.80 III.

B = (110-97)/14.73 + (4-4)/1 = +0.883 = +0.88 I.

C = (81-97)/14.73 + (5-4)/1 = -0.086 = -0.09 II.

Solution b):

A = (0.8)(100-97)/14.73 + (0.2)(3-4)/1 = -0,0371 II.

B = (0.8)(110-97)/14.73 + (0.2)(4-4)/1 = 0,7060 I.

C = (0.8)(81-97)/14.73 + (0.2)(5-4)/1 = -0,6689 III.

Multiple Choices

Which one of the following indicators should be involved in the selection system of a company if their validity were tested on past performance data with the following results?

a) sex/gender of the applicant: mean difference was tested with independent *t*-test (p=0.54)

b) written knowledge test score: Pearson correlation (*r*) = 0.05 (p < 0.04)

c) job interview score: linear correlation (*r*) = -0.30 (p < 0.05)

d) written personality test (classification): ANOVA for mean differences among personality types (p = 0.22)

Four types of motivation tests' validity were analysed with linear correlation (in comparison with the job performance). The coefficients and the significance levels are below. Which one is the best?

a) r = +0.21 (p ≤ 0.34)

b) r = -0.15 (p ≤ 0.08)

c) r = -0.34 (p ≤ 0.04)

d) r = +0.22 (p ≤ 0.04)

In which one of the following situations is it the most suggested to standardize the assessment scores?

a) job interviews with the same interviewer (all applicants gender is the same)

b) combination of more than one written tests' scores into a single measure

c) domestic and foreign applicants are writing the same test

d) two genders are writing the same test

A company analyses its past data, to reveal the predictive value of its selection techniques, and find that PRODUCTIVITY = –1.20 + 0.01(IQ SCORE) + 0.03(INTERVIEW SCORE) + (RANDOM ERROR). If this company would like to weight the IQ and the interview scores for calculating a combined indicator of performance, what weights would be the most acceptable?

a) 25% (IQ) and 75% (Interview)

b) 10% (IQ) and 30% (Interview)

c) 33% (IQ) and 67% (Interview)

d) 0,01 (IQ) and 0,03 (Interview)