Feedback — Week 3

Help

You submitted this quiz on **Sun 13 Oct 2013 7:54 PM PDT (UTC -0700)**. You got a score of **8.00** out of **10.00**. You can attempt again, if you'd like.

Cognitive training is a rapidly growing market with potential to further expand in the future. Several computerized software programs promoting cognitive improvements have been developed in recent years, with controversial results and implications. In a distinct literature, aerobic exercise has been shown to broadly enhance cognitive functions, in humans and animals. My research group is attempting to bring together these two trends of research, leading to an emerging third approach: designed sport training. Specifically designed sports are an optimal way to combine the benefits of traditional cognitive training and aerobic exercise into a single activity. So, suppose we conducted a training experiment in which subjects were randomly assigned to one of two conditions: Designed sport training (des) and Aerobic training (aer). Also, assume that we measured both verbal and spatial reasoning before and after training, using four separate measures: • S1 • S2 • V1 • V2. Simulated data are available here. Save the file to your computer and read it into R to complete the assignment and answer the following questions.

Question 1

What is the correlation between S1 and S2 pre-training?

You entered:

0.49

Your Answer		Score	Explanation
0.49	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

cor(data$S1.pre, data$S2.pre)

Question 2

What is the correlation between V1 and V2 pre-training?

You entered:

0.90

Your Answer		Score	Explanation
0.90	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

cor(data$V1.pre, data$V2.pre)

Question 3

With respect to the measurement of two distinct constructs, spatial reasoning and verbal reasoning, the pattern of correlations pre-training reveals:

Your Answer		Score	Explanation
○ Convergent validity			
○ Divergent validity			
◉ Both	✔	1.00	
○ Neither			
Total		1.00 / 1.00	

Question Explanation

data$S.pre = (data$S1.pre + data$S2.pre) / 2 AND data$V.pre = (data$V1.pre + data$V2.pre) / 2 AND cor(data$S.pre, data$V.pre)

Question 4

Correlations from the control group could be used to estimate test/retest reliability. If so, which test is most reliable?

Your Answer		Score	Explanation
S1			
S2	✖	0.00	
V1			
V2			
Total		0.00 / 1.00	

Question Explanation

data.aer = subset(data, data$cond=="aer") AND cor(data.aer$S1.pre, data.aer$S1.post) AND cor(data.aer$S2.pre, data.aer$S2.post) AND cor(data.aer$V1.pre, data.aer$V1.post) AND cor(data.aer$V2.pre, data.aer$V2.post)

Question 5

Does there appear to be a correlation between spatial reasoning before training and the amount of improvement in spatial reasoning?

Your Answer		Score	Explanation
Yes			
No	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

data$S.pre = (data$S1.pre + data$S2.pre) / 2 AND data$V.pre = (data$V1.pre + data$V2.pre) / 2 AND data$S.post = (data$S1.post + data$S2.post) / 2 AND data$V.post = (data$V1.post + data$V2.post) / 2 AND data$Sgain = data$S.post - data$S.pre AND data$Vgain = data$V.post - data$V.pre AND cor(data$S.pre, data$Sgain)

Question 6

Does there appear to be a correlation between verbal reasoning before training and the amount of improvement in verbal reasoning?

Your Answer		Score	Explanation
Yes			
No	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

cor(data$V.pre, data$Vgain)

Question 7

Which group exhibited more improvement in spatial reasoning?

Your Answer		Score	Explanation
des	✔	1.00	
aer			
Total		1.00 / 1.00	

Question Explanation

library(psych) AND describeBy(data$Sgain, data$cond)

Question 8

Create a color scatterplot matrix for all 4 measures at pre-test. Do the scatterplots suggest two

reliable and valid constructs?

Your Answer		Score	Explanation
Yes	✔	1.00	
No			
Total		1.00 / 1.00	

Question Explanation

library(gclus) AND pre.r = abs(cor(pre = cbind(data[3], data[4], data[7], data[8]))) AND cpairs(pre, order.single(pre.r), panel.colors = dmat.color(pre.r), gap=.5)

Question 9

Create a color scatterplot matrix for all 4 measures at post-test. Do the scatterplots suggest two reliable and valid constructs?

Your Answer		Score	Explanation
Yes	✔	1.00	
No			
Total		1.00 / 1.00	

Question Explanation

post.r = abs(cor(post = cbind(data[5], data[6], data[9], data[10]))) AND cpairs(post, order.single(post.r), panel.colors = dmat.color(post.r), gap=.5)

Question 10

What is the major change from pre-test to post-test visible on the color matrix?

Your Answer	Score	Explanation
Variance		

Correlation coefficients	✖	0.00
Construct validity		
All of the above		
Total		0.00 / 1.00

Question Explanation

cf both scatterplot matrices