

Practice with Mutiple Regression

1a. Tell how to interpret each of the following correlations
 + r for a quantitative (continuous) predictor variable

nsig r for a quantitative (continuous) predictor variable

-r for a quantitative (continuous) predictor variable

+ r for a binary predictor variable

nsig r for a binary predictor variable

-r for a binary predictor variable

b. Tell how to interpret each of the following simple regression weights

+ b for a quantitative (continuous) predictor variable

nsig b for a quantitative (continuous) predictor variable

-b for a quantitative (continuous) predictor variable

+ b for a binary predictor variable

nsig b for a binary predictor variable

-b for a binary predictor variable

c. Tell how to interpret each of the following multiple regression weights

+ b for a quantitative (continuous) predictor variable

nsig b for a quantitative (continuous) predictor variable

-b for a quantitative (continuous) predictor variable

+ b for a binary predictor variable

nsig b for a binary predictor variable

-b for a binary predictor variable

d. When one considers the correlation of a specific predictor with the criterion and that predictor's contribution to a multiple regression, there are nine possibilities. Specify each of them (there might be a "special name" or maybe just a description).

Multiple Regression Weight	Correlation		
	significant -	non-significant	significant +
significant -			
non-significant			
significant +			

2. Here's a set of correlations and a full-model regression with "Therapeutic Outcome" (larger scores are "better") for "Type of Therapy" (1=conventional 2=experimental).

Predictor ==>	Age	Initial Wellness	Amount Prior Therapy	Number of Current Sessions	Type of Therapy
correlation	.42	.38	-.43	.18	.45
(p-value)	(.03)	(.04)	(.03)	(.21)	(.03)
reg. weight	-3.21	2.21	-1.89	.512	8.24
(p-value)	(.01)	(.89)	(.14)	(.04)	(.04)

a. Based on the simple correlations, which are viable single predictors?

b. How would you interpret the correlation of the following predictors and the criterion variable?

Age

Amount of Prior Therapy

Type of Therapy

c. Which predictors are contributing to the full model?

d. How would you interpret the multiple regression weight of the following predictors?

Age

Initial Wellness

Number of Current sessions

Type of Therapy

e. What is the most likely reason that Initial Wellness is not contributing to the full model?

f. What is the most likely reason that Type of Therapy is contributing to the full model?

g. Any suppressor variables? How would you NOT want to interpret the regression weight of that variable?

3. GENDER (1=male, 2=female) SCTYP (school type; 2=public 1=private) SES (1 = low, 2 = mid)
 The criterion is performance on a standardized "senior examination" which must be passed to graduate.

Predictor ==>	SCTYP	GENDER	SES	RDG	WRTG	MATH	SCI	ABSENCES
Correlation	-.18	.14	.58	.61	.06	.13	.51	-.31
(p-value)	(.04)	(.20)	(.01)	(.01)	(.62)	(.44)	(.01)	(.04)
reg. weight	-.821	.873	.005	.343	.049	.0001	.434	-.121
(p-value)	(.01)	(.04)	(.89)	(.02)	(.71)	(.97)	(.01)	(.132)

- Circle the correlations of the viable single predictors?
- Circle the regression weights of those predictors that are contributing to the full model?
- Put a square around any predictors that are not contributing to the full model "probably because they are not sufficiently strongly related to the criterion variable."
- Put a triangle around any predictors that are not contributing to the full model "probably because they are collinear with one or more of the other variables."
- List the names of any "suppressor variables" below.
- Tell the meaning of the SCTYP correlation in words.
- Tell the meaning of the SCI correlation in words.
- Tell the meaning of the GENDER correlation in words.
- Tell the meaning of the ABSENCES correlation in words.

Bonus: Based on the weights from the full regression model, if my estimated senior exam score were 85, but I just re-took READING test and scored 10 points higher ! What would be the new estimate of my senior exam score?