

## Answers

### 1a. interpreting correlations

quant predictors

+r direct relationship -- those with higher scores on the predictor tend to have higher scores on the criterion (and vice versa)

nsig r no reliable relationship between pred and crit -- knowing value of one tells you nothing about value of the other

-r indirect relationship -- those with higher scores on the predictor tend to have lower scores on the criterion (and vice versa)

binary predictors

+r group with higher coded value has higher mean score on the criterion (and vice versa)

nsig r no reliable mean difference on the criterion between the groups

-r group with the higher coded value has lower mean score on the criterion (and vice versa)

### b. interpreting simple regression weights

quant predictors

+b direct relationship -- each 1-point increase in the predictor is expected to be associated with an increase in the predicted criterion score equal to "b"

nsig b no reliable prediction about the change in the predicted criterion score based on changes in that predictor,

-b indirect relationship -- each 1-point increase in the predictor is expected to be associated with an decrease in the predicted criterion score equal to "b"

binary predictors

+b group with higher coded value had a mean on the criterion score "b" higher than the group with the lower coded score

nsig b no reliable mean difference on the criterion between the groups

-b group with higher coded value had a mean on the criterion score "b" lower than the group with the lower coded score

### c. interpreting multiple regression weights

quant predictors

+b direct relationship -- each 1-point increase in the predictor is expected to be associated with an increase in the predicted criterion score equal to "b", if the values of the other predictors are held constant (controlled for) (and vice versa)

nsig b no reliable prediction about the change in the predicted criterion score based on changes in that predictor, "b", if the values of the other predictors are held constant (controlled for) (and vice versa)

-b indirect relationship -- each 1-point increase in the predictor is expected to be associated with an decrease in the predicted criterion score equal to "b", if the values of the other predictors are held constant (controlled for) (and vice versa)

binary predictors

+b group with higher coded value had a mean on the criterion score "b" higher than the group with the lower coded score, if the values of the other predictors are held constant (controlled for) (and vice versa)

nsig b no reliable mean difference on the criterion between the groups, if the values of the other predictors are held constant (controlled for)

-b group with higher coded value had a mean on the criterion score "b" lower than the group with the lower coded score, if the values of the other predictors are held constant (controlled for) (and vice versa)

## Considering correlations and regression weights

Multiple Regression Weight	Correlation		
	significant -	non-significant	significant +

significant -	***	!!!	!!!
non-significant	^^^	boring variable	^^^
significant +	!!!	!!!	***

\*\*\* good correlate & direct contributor    ^^ good correlate, but collinear with other predictors    !!! Suppressor variable

- 2a. Age, Initial Wellness, Amount of Prior Therapy & Type of Therapy -- all  $p < .05$
- b. Age -- older patients tend to have higher Therapeutic Outcome scores.  
 Amount of Prior Therapy -- those with less prior therapy tend to have higher Therapeutic Outcome scores  
 Number of Current Sessions -- no reliable bivariate relationship  
 Type of Therapy -- those receiving the experimental therapy has a higher average Therapeutic Outcome score
- c. Age, Number of Current Sessions, Type of Therapy
- d. Age -- a 1-year increase in age is associated with a 3.21 decrease in predicted Therapeutic Outcome score, holding scores on all other predictors constant  
 Initial Wellness -- after holding scores on all other predictors constant, there is no reliable expected change in Therapeutic Outcome score associated with differences in Initial wellness  
 Number of Current Sessions -- each additional current session is associated with a .512 increase in predicted Therapeutic Outcome score, holding scores on all other predictors constant  
 Type of Therapy -- Those receiving the experimental treatment have mean Therapeutic Outcome score 8.24 higher than those in the conventional treatment group, holding constant (controlling for) scores on all the other predictors constant
- e. It is collinear with one or more of the other variables in the multiple regression model
- f. It is correlated with the criterion and is not strongly collinear with the other variables in the multiple regression model
- g. Age (+r but -b) and Number of Current Sessions (0r but +b). Don't interpret the regression weight as telling you the direction and/or strength of the bivariate relationship between that predictor and the criterion
- 3a. viable single predictors include sctypm ses, rdg, sci & absences
- b. regression contributors included sctyp, gender, rdg & sci
- c. "not correlated" non-contributors included wrtg and math
- d. "collinear" non-contributors included ses & absences
- e. gender is a suppressor
- f. the "-" correlation indicates that private school students (with the smaller code values) tend to have higher mean exam scores than public school students (with the larger code values)
- g. those with higher math scores tend to have higher exam scores
- h. we would interpret this "non-significant" correlation to mean there is no linear relationship between the variables -- that's what  $H_0$ : testing means (a couple acknowledged the non-significance and then interpreted the correlation, based on the idea the effect size wasn't trivial -- that's OK, but may get punished in research reports!)
- i. the "-" correlation indicates that those with fewer absences tend to have higher exam scores
- bonus. A multiple regression weight tells the expected change in the criterion for a 1-unit change in that predictor, if the values of all other predictors are held constant, so  $85 + (10 * .343) = 88.43$ . I was delighted in the number of folks who got this !!!