The Last Lab Quiz!!

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I examined the extent to which exam grades (E) were predicted by anxiety (A) and preparation (P). As indicated in Table 1, when the predictors were examined individually, there was a strong positive relation between anxiety and exam grades, *r*=.69, 95% CI[.64,.73], such that as anxiety increased exam grades also increased. Additionally there was a moderate to strong positive relation between preparation and exam grades, *r*=.49, 95% CI[.42,.56], such that as preparation increased so did exam grades.

I used moderated multiple regression to test the extent to which the relation between anxiety and exam grades depended on the amount of exam preparation. I assessed this moderation by examining the interaction between anxiety and preparation ususing centered predictors (consistent with the recommendations of Cohen, Cohen, West and Aiken (2003)), see Table 2. Together the predictors (anxiety, preparation, and their product) accounted for a substantial variance in exam grades, =.62, 95% CI[.57,.66], *p*<.01. Results for the product term in this analysis were mixed. Specifically the p value for the anxiety by preparation product term was below .05, *t*(496) = 6.061, *p* < 0.0001, which suggests the presence of an interaction. However, an inspection of squared semi-partial correlation for the product term indicated the proportion of variance accounts for was small, = .03 and the confidence interval came very close to zero, 95% CI[.01,.05]. In light of this conflicting information regarding the presence of an interaction, I opted on the side of discovery and explored the regression surface with simple-slope analyses - though caution is needed when interpreting these findings.

The regression surface is presented in Figure 1 and the simple-slope cross-sections are presented in Figure 2. When preparation is high (ie., +1SD) there was a positive relation between anxiety and exam grades, *b* = 19.49, 95% CI[17.50,21.48], *t*(496) = 19.26, *p*<.001, see Equation 1 below. When preparation was low (ie., -1SD), there was also a positive relation between anxiety and exam grade, *b* = 11.02, 95% CI[9.08,12.96], *t*(496) = 11.02, *p*<.001, see Equation 2 below.

Eˆ = 19.46A + 55.90 (1)

Eˆ = 11.02 + 42.52 (2)

Thus the relation between anxiety and exam grades does not appear to be moderated by the extent to which students prepared for the exam. As anxiety increases, exam grades also increase regardless of whether students extensively prepared or not.

Table 1

*Means, standard deviations, and correlations with confidence intervals*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | *M* | *SD* | 1 | 2 |
|  |  |  |  |  |
| 1. exam | 50.00 | 20.00 |  |  |
|  |  |  |  |  |
| 2. anxiety | 4.10 | 0.80 | .69\*\* |  |
|  |  |  | [.64, .73] |  |
|  |  |  |  |  |
| 3. preparation | 3.90 | 0.70 | .49\*\* | .23\*\* |
|  |  |  | [.42, .56] | [.15, .31] |
|  |  |  |  |  |

*Note.* \* indicates *p* < .05; \*\* indicates *p* < .01. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014).





Figure 1.



Figure 2.