# PSYR6003 Assignment 2

Daniel Basso

Dalhousie University

Department of Psychiatry

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**Hypotheses**

**H1:** Sex, conscientiousness, and SPP will all significantly predict negative affect, in the manner described above.

**H2:** SPP will predict unique variance in negative affect over and above sex and conscientiousness in a meaningful way.

**Method**

**Analytic Plan**

Mean scale scores will be computed for perfectionism, negative affect, and conscientiousness prior to analysis. Participants with missing scale items or missing sex data will be excluded from analysis. Sex will be dummy coded so that females are represented by 0 and males are represented by 1; participants of other birth sexes will be removed, unless there are adequate cases for analysis as a separate category.

General linear modelling will be used in order to test H1 and H2. For H1, sex, conscientiousness, and perfectionism will be added into the model as predictors for negative affect. For H2, the model in H1 will be compared to a reduced model of sex and conscientiousness as the only predictors of negative affect. If the full model from H1 shows better fit indices compared to this reduced model, it will provide support for perfectionism’s meaningful value as a predictor over and above sex and conscientiousness. Semi-partial R2 will also be used to quantify the value of perfectionism as a predictor of negative affect as compared to sex and conscientiousness.

Prior to the aforementioned analyses, the univariate distributions of study variables will be visualized, and model assumptions will be checked. Adjustments to the above analytic plan will be considered (e.g., the use of robust errors, quadratic modelling) should assumptions be violated. Any adjustments will be compared to the original planned model for fit, with the best fitting model being the one chosen for final analysis.

**Results**

**Descriptive Statistics**

Descriptive statistics (i.e., mean and standard deviation) and bivariate correlations for all study variables are depicted in Table 1. Negative affect had a moderate positive association with perfectionism, while conscientiousness had a moderate negative association with both negative affect and perfectionism. Sex had no meaningful associations with any other study variables.

**Statistical Assumptions & Data Analysis**

Those with sexes outside of male or female were eliminated from the dataset (n=1) due to lack of power for its own categorical group.

Statistical assumption checks for the planned model showed slight negative kurtosis with a positive skew in the data’s residuals, but not enough to outrightly violate normality assumptions. The data also showed reasonable homoskedascity based on the flat line seen in the S-L plot. However, the data violated the linearity assumption needed for the general linear model, due to a slight curvature and bump seen in the residual dependence plot. As such, the model was rerun with robust errors, as well as rerun with a quadratic fit due to the patterns seen in the univariate distribution. The severity of the violations seen in the residual dependence plot minimized and model fit was increased from R2 = 0.269 to R2 = 0.299 when the model was run using the quadratic model, thus we added a sensitivity analysis using the quadratic model.

**Hypotheses 1 & 2**

Estimates for the full and reduced model are shown in Table 2. Estimates are in line with our hypotheses. Specifically, sex predicted negative affect in that women tended to have higher negative affect than men by about 0.58 in score differences; however the confidence interval for sex includes 0, so we cannot say that the H1 hypothesis regarding sex was fully supported. Conscientiousness negatively predicted negative affect in that high scores of conscientiousness were associated with decreases in negative affect. Perfectionism positively predicted negative affect.

Model comparisons for the full and reduced model are shown in Table 3. In line with H2, fit indices in Table 3 indicate that the full model, which includes perfectionism, is superior in predicting negative affect, as compared to the reduced model without perfectionism. This is shown by the full model having a lower AIC and BIC, as well as a higher Bayes Factor (over 100, indicating definite evidence) and R2 than the reduced model. The full model, including perfectionism, would be able to predict up to a 0.64 difference in negative affect scores compared to the reduced model. This indicates that perfectionism is a meaningful component in the model for predicting negative affect. Additionally, it accounts for 13% of the variance in the model, as compared to the 9% and 4% for conscientiousness and sex, respectively.

**Sensitivity Analyses**

Since the linearity assumption was violated, a sensitivity analysis of the full model with quadratic modelling was performed. Estimates are seen in Table 2. In this model, only our conscientiousness hypothesis remained supported, emphasizing the caution that should be taken with the linear model results.

**Conclusion**

Our results highlight the importance of perfectionism as a predictor of negative affect separate from sex and conscientiousness. However, model limitations and assumption violations should be taken into account when interpreting these findings.

**Table 1**

*Descriptive Statistics and Bivariate Correlates for Study variables*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | *M* | *SD* | 1 | 2 | 3 |
|  |  |  |  |  |  |
| 1. Perfectionism | 4.38 | 1.43 |  |  |  |
|  |  |  |  |  |  |
| 2. Negative Affect | 2.44 | 0.98 | .37\*\* |  |  |
|  |  |  | [.21, .51] |  |  |
|  |  |  |  |  |  |
| 3. Conscientiousness | 5.03 | 1.29 | -.21\* | -.37\*\* |  |
|  |  |  | [-.37, -.04] | [-.51, -.22] |  |
|  |  |  |  |  |  |
| 4. Sex | - | - | .01 | -.16 | -.14 |
|  |  |  | [-.16, .18] | [-.32, .01] | [-.30, .03] |
|  |  |  |  |  |  |

*Note.* Sex is coded as Male = 1 and Female = 0.

**Table 2**

*Estimates for the Full and Reduced Models*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | b | 95%CI | SE | R2 |
|  |  |  |  |  |
| Full (Linear) |  |  |  | 2.69 |
| Intercept | 2.93 | [2.09, 3.77] | 0.42 |  |
| Perfectionism | 0.20 | [0.10, 0.31] | 0.05 | 0.13 |
| Conscientiousness | -0.26 | [-0.37, -0.14] | 0.06 | 0.09 |
| Sex | -0.58 | [-1.16, 0.01] | 0.21 | 0.04 |
|  |  |  |  |  |
| Reduced |  |  |  | 0.20 |
| Intercept | 5.40 | [3.80, 7.00] | 0.32 |  |
| Conscientiousness | -0.31 | [-0.43, -0.19] | 0.06 | 0.14 |
| Sex | -0.59 | [-1.21, 0.03] | 0.22 | 0.05 |
|  |  |  |  |  |
| Quadratic |  |  |  | 2.99 |
| Intercept | 4.92 | [2.99, 6.85] | 0.99 |  |
| Perfectionism | -0.28 | [-0.81, 0.26] | 0.27 | 0.13 |
| Perfectionism2 | 0.06 | [-0.01, 0.12] | 0.03 | 0.02 |
| Conscientiousness | -0.74 | [-1.40, -0.09] | 0.34 | 0.09 |
| Conscientiousness2 | 0.05 | [-0.02, 0.12] | 0.03 | 0.01 |
| Sex | -0.51 | [-1.09, 0.07] | 0.21 | 0.04 |
|  |  |  |  |  |

*Note.* Sex is coded as Male = 1 and Female = 0.

**Table 3**

*Model Comparisons for the Full and Reduced Models*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | AIC | BIC | Bayes Factor | R2 |
|  |  |  |  |  |
| Full | 333.26 | 347.63 | 111.43 | 0.27 |
| Reduced | 345.56 | 357.06 | <0.01 | 0.19 |
|  |  |  |  |  |
| Predicted Differences |  |  |  |  |
| 0% | 25% | 50% | 75% | 100% |
| 0.007 | 0.073 | 0.23 | 0.357 | 0.644 |
|  |  |  |  |  |