**What is this test used for?**

A multiple regression is used for two main reasons in psychology: (1) to predict new values for a dependent variable given values on multiple independent variables and (2) determine how much of the variation in a dependent variable is explained by multiple independent variables. Independent variables are also referred to as predictor variables.

H0: VARIABLE(S) X1, X2, X3… will not significantly predict VARIABLE Y (the dependent variable); b*1* = 0.

H1: VARIABLE(S) X1, X2, X3… will significantly predict VARIABLE Y (the dependent variable); b*1* ≠ 0.

**Assumptions**

1. One dependent variable measured at the interval or ratio level.
2. Two or more independent variables that are measured at either the continuous (ratio or interval) or nominal level.
3. Independence of errors (residuals).
4. A linear relationship between the predictor variables (and composite) and the dependent variable.
5. Homoscedasticity of residuals (equal error variances).
6. No multicollinearity.
7. No significant outliers or influential points.
8. Errors (residuals) are normally distributed.

**Interpretation**

1. Look at results of the omnibus test (the *F* statistic) and significance value (the *p* value).
   1. If the *p* value is less than your alpha level (normally .05), then you reject your null hypothesis.
   2. If the *p* value is larger than your alpha level (normally .05), then you fail to reject (or you accept) your null hypothesis.
2. Look at the results of the individual *t* tests for each variable in your model.
   1. If the *p* value is less than your alpha level (normally .05), then you know that variable is a *significant* and *unique* predictor in your prediction model.
      1. Look at the *t* statistic. If it is positive, then there is a positive relationship between that variable and the dependent variable. If it is negative, there is a negative relationship between that variable and the dependent variable.
   2. If the *p* value is larger than your alpha level (normally .05), then you know that variable is not a significant predictor in your prediction model.
      1. Remove variables that are not significant predictors. The only exception is for control variables (i.e., age, gender, race, income, education, etc.). Those are often kept in a model even if they are not a unique and significant predictor.

**Effect Size Test**

*r2*

This value tells you how much variance your independent or predictor variables explain in your dependent variable. (i.e., how much of the pie is being explained?).

r2 = 0.01 Small Effect

r2 = 0.09 Medium Effect

r2 = 0.25 Large Effect

**Reporting**

A multiple regression was run to predict DEPENDENT VARIABLE from INDEPNDENT VARIABLES. The multiple regression model statistically significantly predicted DEPENDENT VARIABLE, F(*df* regression, *df* total) = ??, p < .05 or > .05, adj. *r2* = .??. All variables added statistically significantly to the prediction, p < .05. Regression coefficients and standard errors can be found in Table 1 (below).

**Real World Meaning**

When discussing the importance of your results, there are a couple things to consider.

1. How much variable in your dependent variable is predicted by your independent or predictor variables?
   1. Look at the *r2.* How big is the effect size?
      1. For example, you would say, “experiences with sexism and racism predicted 24% of the variance in depression.” This is a large effect and is meaningful.
2. What is the relationship between your dependent and independent variables?
   1. Look at the *t* statistics to see if they are positive or negative so you can explain the relationship.
      1. Building off the previous example, “Experiences with sexism and racism predicted 24% of the variable in depression. The more discrimination a person experienced due to their race or their gender, the more depressed they reported being.”